INFLUENCE OF PROFICIENCY IN ENGLISH AND SELECTED CONTEXTUAL FACTORS ON ACHIEVEMENT IN PHYSICAL SCIENCE OF STANDARD IX STUDENTS

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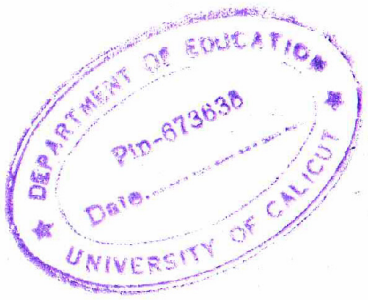
THESIS SUBMITTED FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY IN EDUCATION



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DECLARATION

I, **GOPALAKRISHNAN. P.P**, do hereby declare that the thesis **"INFLUENCE OF PROFICIENCY IN ENGLISH AND SELECTED CONTEXTUAL FACTORS ON ACHIEVEMENT IN PHYSICAL SCIENCE OF STANDARD IX STUDENTS"** has not been submitted by me for the award of Degree, Diploma or Recognition before.

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CERTIFICATE

I, **Dr. C. NASEEMA** do hereby certify that the thesis "**INFLUENCE OF PROFICIENCY IN ENGLISH AND SELECTED CONTEXTUAL FACTORS ON ACHIEVEMENT IN PHYSICAL SCIENCE OF STANDARD IX STUDENTS**" is a record of bonafide study and research carried out by **Mr. GOPALAKRISHNAN. P.P,** under my supervision and guidance and that it has not been previously formed the basis for the award of any Degree Diploma or Recognition.

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INTRODUCTION

The second lunar exploration mission Chandrayaan-2 developed by Indian Space Research Organization launched its spacecraft from Satish Dhawan Space Centre in Andhra Pradesh on 22nd July 2019 at 2.43 PM. IST by a GSLV Mark 111. The spacecraft consisted of a Lunar Orbiter, Vicram Lander, and the Pragyan Lunar Rover. The GSLV Mark 111 and the spacecraft were developed in India. Had the Lander made a soft landing on Moon it would have made India the fourth country to accomplish such a mission after Soviet Union, United States and China. But as the Lander deviated from its intended trajectory while landing on the south pole region of Moon on 6th September 2019 resulted in a harsh landing. The crash was caused by software glitch. ISRO with its all past experience is trying to reattempt for a successful landing on Moon by the second quarter of 2021.

Advancement in science and technology helps us to explore and harness the universal resources for the welfare of humanity. The progress, welfare and security of the nation depends critically on a rapid, planned and sustained growth in the quality and extent of education and research in science and technology. As we are in a technological savvy world of E-age, the need and significance of science education is inestimable.

Science has tremendously transformed man's social, cultural and economic environments. Science education and research in science and technology play an important role in the development of the individual, society and our nation. No doubt science improves our living conditions and standard of

life, but the basic thing that science should do is to teach us to think straight and to act straight. Science being the seeker of truth, it can dispel man's superstitions, suspicions and fears and can pave way for true culture along with better living conditions. Science helps to affect the minds and transforms the way of life of rising generations so that the nation may imbibe the spirit of science. In this context as a formal agency school has an important role to play.

The aim of teaching any subject in school is directed towards achieving the aims and objectives of education. The teaching of science as a subject is to impart pure knowledge, to inculcate scientific attitude and to instill the spirit of science. Then only we can produce socially useful efficient future citizens. If we do not have cultural development, the material development that science bestow upon us is of no avail. Language education mainly aims at cultural and moral development along with communication skill. The stories and parables, histories of Saints and Prophets, Epics and all kinds sacred scriptures are treasure houses of wisdom capable to kindle the innate dormant goodness in mankind. The findings of eminent psychologist Chomsky (2013) states that human nature and innate personality of we human beings are essentially good. He points out that even at the extreme levels of depravity, the Nazis did not boast that they wanted to kill Jews, but gave crazed justifications – even that they were acting in "self-defence". Cultural elegance of human beings! This innate cultural elegance is to be fully developed through education and this should be one of the important aims of education.

The findings of Agnihotri (2013) is that the purpose of language is not only communication but it should also act as a means for establishing good

rapport and relationship for maintaining good citizenship in national and even in international scenario. The innate language hypothesis proposed by Chomsky (2015), Vygotsky's (1962) view point that language is essentially the result of social interaction, the behaviorist's stimulus – response principle and Piagetian (1958) assimilation and accommodation theories through operational stages are all point out that language learning is very easy under favorable conditions and human beings possess a natural ability to learn different languages irrespective of the fact that the motivation is either integrative or instrumental.

The present world scenario is more complex due to the increasing challenges and threats caused by terrorism, brutal atrocities and violence. War and violence due to our essential differences like sex, language, religion, race, politics, culture, etc undermines our gregarious social set up, human rights and fundamental freedom. According to UNESCO, "since wars begin in the minds of men, it is the minds of men that the defense of peace must be constructed". Culture of peace is a set of values, attitudes, modes of behavior and ways of life that reject violence and prevent conflicts. For this, broad understanding and tackling of the root causes and whole hearted effort to solve problems through talks, discussions and negotiations among individuals, groups and nations are the only effective remedy, recommendable. This involves an integrated and holistic awareness of our ever evolving, ephemeral mundane world. The need and significance of science education and language education is that it together can play the essential roles to achieve this social and cultural aims of education and the responsibility incumbent on teachers in this regard is inestimable.

Science teacher requires a range of strategies and skills that are common to language teacher and vice versa. Learning of science is, in many a way, like learning a new language and this way science teachers are also language teachers. Sometimes language becomes more specific and defined especially when it deals with scientific terms such as energy, work, power, force etc. These conceptual words in science have a precise meaning and sometimes an exact definition but those words may have a very different meaning in everyday life. For example to a common man work means a task undertaken or an occupation. But to a science teacher 'work' is said to be done when the point of application of the force is moved in the direction of the force.

It is easy to inculcate scientific attitude effectively through science education but sentiments of humanity has little place or chance in it. We poor mundane beings are too weak to recognize or expect or predict our own thoughts and actions in particular situations. The reason for many of our hasty or impetuous actions or thoughts lack specific answers. That is why Milton (1667) the great poet categorically remarks that 'mind is its own place and of itself can make a heaven of hell and hell of heaven'. As such is the case, while living in a world rampant with corruption, atrocity, violence and terrorism one should be over conscious while dealing with problems without any hindrance to one's own peaceful survival or existence. Adhering to the maxim that 'thought requires language and the use of appropriate language requires thought' all problems among individuals, groups, societies or nations can be settled or solved amicably through discussions and negotiations. Seeking and utilizing the full advantages of science and technology, exploring and employing the possibilities of language, upholding and adhering to

the principle 'forget and forgive' the wellbeing of the individual, unity of the society, integrity of the nation and peace and harmony between nations can easily be attained and no doubt, we can hope for a better tomorrow imbued with peace and harmony, a significant transformation, essentially, is the need of the hour.

Need and Significance of the Study

"Culture is the widening of the mind and the spirit" Nehru (1930). According to Mathew Arnold (1880) Culture is sweetness and light. It is beyond doubt that value oriented education is indispensable for the widening of mind and for sweetness of our perfection get blossomed. Can science education inculcate personal, social, national and educational values. Lyotard (1979) and Crottey (1998) the exponents of Postmodernism vehemently criticize and attack the warmongering modern world. They point out that science in the pretext of changing and developing the society and environment by imparting better living conditions actually creates and promotes avenues of oppression, persecution, massacre and total destruction. When those philosophers illustrate it with recent wars especially Second World War and with worlds present pathetic state of affairs entangled in rampant violence, terrorism and corruption we cannot but admit that value oriented education is the only panacea and it is the need of the hour. Can value oriented education be easily imparted through science education?

In the play 'Julius Caesar', by Shakespeare (1599), Caesar utters "Et tu, Brute? Then fall Caesar" (Act III, Scene-1, lines 75-78) as he recognizes his close friend Brutus, among the assassins. This was the great kings, heart touching, last words before his death. Caesar was stabbed to death. Actually,

when Caesar saw Brutus among his enemies he resigned himself to his fate and yielded to the assassins. Caesar loved Brutus so much that Caesar had no other alternative, if even renowned Brutus also wanted to kill him. Hence he did not care for the least protection and resistance and the assassins stabbed him to death.

The last three words pronounced by the eminent king Caesar has its celestial majesty that we relish and accept as a symbol of sacrifice succumbed. This is one of the rare instances where friendships and relationships are sometimes become more paramount, serious and influential than desire for life and fear of death and are capable to stamp indelible impressions to proclaim that friendship and fraternity have great value.

No doubt; in order to inculcate moral values in the students Language education is a better means to this end than science education. If we relay much on science or other subjects for the purpose of value education the deviation from the subject matter may seem purposeful and artificial. But in the case of language irrespective of the difference in languages almost all languages are viable to value oriented education. Here, in this context, one may naturally doubtful whether the importance given to language learning in our curriculum for the sake of value oriented education will be a hindrance to the learning of science and the achievements in science subjects which play a pivotal role in the development and progress of the individual, society and nation. Science education is the most powerful, determining and indispensable factor for achieving better living conditions, what we all want to have, as far as the material aspects of this mundane world is concerned. Hence learning of any language at the expense of

achievements in science education cannot be, at any rate, encouraged or recommendable.

The new two years B.Ed curriculum introduced by NCTE gives ample opportunities for developing basic and higher order language skills and for understanding the colloquial language that prevail in the rural or urban areas of the schools and communities where the teacher educand is undergoing teacher education. Whatever may be the subject or language selected for the course, Pedagogy of a school subject under the second area 'curriculum and pedagogic studies', in the present B.Ed. curriculum of Kerala, each and every B.Ed. student is expected to complete successfully course 4, understanding disciplines and subjects, EPC 1 i.e., language across the curriculum, reading and reflecting on texts and EPC 2 i.e., art and drama in education respectively. Those are courses intended to promote and enhance language efficiency especially English language. The three language formula that now we are following in the curricula for schools, surely will impart new momentum for language education of higher order as these teachers enter into teacher's profession since each and every subject teacher and language teacher has acquired and enhanced the professional capacity to promote language learning along with their pedagogical subjects as they have been trained for that purpose with thorough theoretical knowledge and practical experience.

All the educational attempts are concentrated towards the achievement and development of the students concerned. For achievement of the students curriculum plays an important role. Along with curriculum, achievement and

development of a student are influenced by a number of variables related to both personal factors like intellectual abilities, psychological characteristics etc. and environmental factors like home environment, school environment etc. An overview of the related literature has shown that home environment such as social status, educational status, economic status etc and Parental Support such as attitude, interest, acceptance etc of the parents play a prominent role in the child's achievements.

Nowadays, after school education, it is a long cherished wish or craze for the students to try for medical and engineering entrance examinations that demand thorough knowledge of science subjects. Only a few students select language education and go for general degree courses. So in this context it is worthwhile and need of the hour to examine whether the achievement of the students in the language subjects will affect their achievement in science subjects and in which direction that it will affect, for, of course, it in turn will affect ultimately the prospects of the later life of the students.

But the reality is somewhat different. Though we are giving a balanced importance to both science education and language education our students, when compared to the students of other states, are far behind in their ability in expressing their ideas and in conveying what they want to transact. The investigator has experienced many instances to feel that students from Kerala, though they have enough knowledge of the subject, stand aloof behind the backdrop while taking part in debates, discussions, seminars or symposiums etc. with students of other states. Even those students who got higher ranks in

entrance examinations are often very poor in their performance while they face the interview board and fail as they are unable to express their ideas clearly and fluently when and where it is essentially required. Because of this reason even students having high academic standard are often sidelined in campus interviews and other government and private careers. Though these students possess good certificate of merit in their academic achievements why they are not able to face the situations that needed proper and pat replies, expressions and answers is a question that needs thorough perusal.

Considering these forgoing facts and doubts and intended to put forward some suggestions and solutions the investigator decided to conduct a study to find out whether there exists any relationship between the students' knowledge in science subjects and their proficiency in English.

Though there is twenty years teaching experience in high school classes both in science and language, nine years teaching experience in higher secondary classes and eight years teaching experience in B.Ed. Colleges, the investigator do not have enough instances to prove or substantiate that the importance given to language learning as envisaged and delineated by NCTE will not become a hindrance in the achievement in science subjects or instead the achievement in languages will enhance pupil's ability in the achievement in science subjects. Hence the investigator being a former Physical science teacher in secondary school intended to make a study to find out the Influence of Proficiency in English and Selected Contextual Factors on Achievement in Physical Science of Standard IX Students.

Title of the Study

The problem under study is entitled as "**INFLUENCE OF PROFICIENCY IN ENGLISH AND SELECTED CONTEXTUAL FACTORS ON ACHIEVEMENT IN PHYSICAL SCIENCE OF STANDARD IX STUDENTS**".

Definitions of Key Terms

Achievement in Physical Science

Achievement in Physical Science used here means Achievement in Physics and Achievement in Chemistry. Also, Achievement in Physics and Achievement in Chemistry indicates the acquisition of the most important and indispensable ideas covering the important content areas which should be mastered at a particular stage so as to get a comprehensive idea of the discipline.

For the present study, 'Achievement in Physics and Achievement Chemistry' were measured through standardized tests constructed for standard IX students by the investigator with the help of supervising teacher.

Proficiency in English

Proficiency in English means the ability of students to use English language to make and communicate meaning in spoken and written contexts while completing their programme of study. In the present study Proficiency in English means acquisition of the most important and indispensable ideas covering the important content areas which should be mastered at a particular stage so as to get a comprehensive idea of the English language.

Proficiency in English was measured through a standardized test constructed by the investigator with the help of supervising teacher for standard IX students.

Contextual Factors

Contextual Factors means the characteristics unique to a group, community, society or environment pertaining to that particular context. For the present study Contextual Factors means the facts or statistics that affect classroom achievement due to home environment. This includes Socio-Economic Status and Parental Support.

1. Socio-Economic Status includes (i) Educational level (ii) Income level. For the present study Contextual Factors were measured through scores obtained in standardized tests constructed by the investigator with the help of supervising teacher.
2. The main components of Parental Support identified are (i) Parental aspiration (ii) Parental attention (iii) Parental encouragements (iv) Parental guidance (v) Parental influence and (vii) Parental interest which will enhance both mental and physical development of the child.

Variables of the Study

The study is designed with Achievement in Physical Science (Achievement in Physics and Achievement Chemistry) as dependent variables and Proficiency in English and Selected Contextual Factors (Socio-Economic Status and Parental Support) as independent variables.

Objectives of the Study

The objectives of the present study are as follows:

1. To find out the mean scores of the Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) and Proficiency in English and the selected Contextual Factors (Socio-Economic Status and Parental Support) for total sample and the selected subsamples such as gender of students, locality and management category of schools.

2. To find out whether there exists any significant difference in the mean scores of the Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) and Proficiency in English and the selected Contextual Factors (Socio-Economic Status and Parental Support) for the selected subsamples such as gender of students, locality and management category of schools.

3. To estimate the extent of relationship among Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) and Proficiency in English and the selected Contextual Factors (Socio-Economic Status and Parental Support) for total sample and the selected subsamples such as gender of students, locality and management category of schools.

4. To compare the relationship among Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) and Proficiency

in English and the selected Contextual Factors (Socio-Economic Status and Parental Support) for the selected sub samples such as gender of students, locality and management category of schools.

5. To find out whether Achievement in Physical Science can be predicted from Proficiency in English and selected Contextual Factors (Socio-Economic Status and Parental Support) for the total sample.

Hypotheses of the Study

1. The mean scores of the Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) and Proficiency in English and the selected Contextual Factors (Socio-Economic Status and Parental Support) for total sample and the selected subsamples such as gender of students, locality and management category of schools will be different.

2. There will be significant difference in the mean scores of the Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) and Proficiency in English and the selected Contextual Factors (Socio-Economic Status and Parental Support) for the selected subsamples such as gender of students, locality and management category of schools

3. There will be significant relationship among Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) and Proficiency in English and the selected Contextual Factors (Socio-Economic Status and Parental Support) for total sample and the selected subsamples such as gender of students, locality and management category of schools

4. There will be significant difference in the relationship among Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) and Proficiency in English and the selected Contextual Factors (Socio-Economic Status and Parental Support) for the selected subsamples such as gender of students, locality and management category of schools.

5. Achievement in Physical Science can be predicted from Proficiency in English and selected Contextual Factors (Socio-Economic Status and Parental Support) for the total sample.

Methodology

The methodology of the present study is briefly described under the following headings.

Design of the Study

For the present study, survey method was employed and quantitative techniques were used for analysis.

Sample Used for the Study

The study was conducted on a representative sample of 1000 students studying in standard IX, randomly from the schools situated in the Revenue Districts of Kannur, Kozhikode, Malappuram, Palakkad, Thrissur, Ernakulam, Kottayam, Alappuzha, Kollam and Thiruvananthapuram in Kerala. Stratified random sampling technique was used, giving due representation to factors like gender of the students, location of the schools (urban and rural) and management category of schools (Government and Private)

Tools Used for the Study

For the present study, the investigator has used the following tools for the collection of data.

1. Achievement Test in Physics for standard IX students (Gopalakrishnan & Naseema, 2018).
2. Achievement Test in Chemistry for standard IX students (Gopalakrishnan & Naseema, 2018).
3. Proficiency in English Test for standard IX students (Gopalakrishnan & Naseema, 2018).
4. Socio-Economic Status Scale (Gopalakrishnan & Naseema, 2018).
5. Questionnaire on Parental Support (Gopalakrishnan & Naseema, 2018).

Statistical Techniques Used

1. Preliminary analysis.
2. Test of Significance of Difference between Means.
3. Pearson's Product Moment Coefficient of Correlation 'r'.
4. Test of Significance of Difference between 'r' s.
5. Multiple Linear Regression Analysis.

Scope and Limitations of the Study

The aim of the present study was to find out the Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) in relation to the Influence of Proficiency in English and Selected Contextual Factors. The study has been restricted on a representative group of secondary school students

attending standard IX, randomly selected from the schools situated in the Revenue Districts of Kannur, Kozhikode, Malappuram, Palakkad, Thrissur, Ernakulam, Kottayam, Alappuzha, Kollam and Thiruvananthapuram in Kerala. The schools were selected from the categories, where due representation was given to gender of the students (Male and Female), Locality of the school (Urban or Rural) and type of management of schools (Government or Private). All the required variable were measured using the standardized tests. Tools of high validity and reliability were used to collect the data. Therefore, the findings of the study will be valid and generalizable up to a great extent.

Organization of the Report

Chapter I of this report contains a brief introduction of the problem, need and significance of the study, statement of the problem, definition of key terms, variables, objectives, hypotheses, methodology and scope and limitation.

In chapter II there is a summary of the reviewed related studies.

In chapter III, the methodology of the study is described under headings like variables, tools used, selection of the sample, data collection and scoring procedure and statistical techniques used for analysis.

Details of the statistical analysis of the data and discussion of the results are attempted in chapter IV.

Chapter V presents a summary of the procedure, major findings, tenability of hypotheses, educational implications of the study and suggestions for further research.

Chapter 2

REVIEW OF RELATED LITERATURE

- *Studies Related to Achievement, Proficiency and Contextual Factors*

REVIEW OF RELATED LITERATURE

Eliot (1919) in his famous critical essay 'Tradition and Individual Talent' points out that "Whereas if we approach a poet without this prejudice, we shall often find that not only the best, but the most individual part of his work may be those in which the dead poets, his ancestors, assert their immortality most vigorously". In these lines the eminent critic, poet and playwright ridicules the hypocrisy of English people that they always praise and boast, honour and accept what is original. The eminent critic insists that without tradition one cannot be original in any work of art or in any creative work of excellence. Research work also is of no exception. What is the tradition of a particular research field that the researcher is going to deal with is to be clearly sought and understood by the researcher before entering into a research study. What were the procedures adopted for doing similar kinds of research, what were the research designs, how the data had been collected, what methods were used to analyse the data and how the conclusions were arrived at by our ancestors should be thoroughly perused before beginning a research investigation. The researchers individual talent has to be blossomed fully by imbibing the vigor and vitality of the past. Then only the researcher will be fully equipped with the full fledged knowledge of conducting a research and capable of taking necessary deviations from the ancestral path by making use of researcher's individual talent for finding out new avenues, better fields, new approaches, methods and techniques unfathomed.

Review of related literature provides the investigator with the means of getting the required up to date information about the problem of research which

the investigator intends to undertake. It also helps to avoid duplication. Useful information and helpful suggestions for the investigation can be easily sought through review and it gives suitable methods, easy means and effective measures to conduct the required research. Review of related literature is the corner stone of the foundation on which all the future edifice of research is to be put up. In this chapter, the investigator, attempted to examine and present the views of some of the researchers pertaining to the influence of English education and home environment on the scholastic achievement of students. In the present chapter, the reviewed studies are presented below in reverse chronological order.

Studies Related to Achievement and Contextual Factors

Engin (2020) in a study entitled “An Examination of Primary School Students' Academic Achievements and Motivation In Terms of Parents' Attitudes, Teacher Motivation, Teacher Self-efficacy and Leadership Approach” aimed to examine primary school students' academic achievement and motivation in terms of parental attitudes, teacher motivation, teacher self-efficacy and leadership perception. The study was designed as descriptive research model and the data were collected from 60 primary school teachers teaching 4th grade students in 2017-2018 academic year and from 1476 4th grade primary school students. The findings of the study show that fathers' having a high level of education and a democratic attitude in family are some factors positively affecting student achievement.

‘An investigation of parental involvement and student academic achievement in middle school’ is conducted by Smokoska (2020). The purpose of this research study ‘parental involvement and student academic achievement’

was to determine parental involvement levels and student academic achievement levels among different ethnicities. The study was conducted in a diverse school in the Chicago suburbs. The study had 41 student and parent participants. A survey about parental involvement at home and parental communication with the school was conducted. In addition to the surveys, students' final English grades, final science grades, and English MAP scores were also analyzed. The results of the study revealed that parents of White students demonstrated the highest levels of communication with school and that White students had the highest levels of academic achievement compared to African American and Hispanic students. Pearson correlation revealed that there were two significant positive correlations between parental involvement and student academic achievement.

The study by Stoffelsma and Spooren (2019) revealed that the relationship between academic performance and English reading proficiency of first-year science and mathematics university students in Ghana is significant. From a sample of 133 students the data were collected. The study demonstrated significant medium-sized effects of English reading proficiency on students' grade point average (GPA) by the end of year 1 and a significant indirect relationship between reading proficiency and the final GPA scores by the end of year 4, mediated by the GPA scores after year 1. The findings show that the English reading proficiency of students in a non-western multilingual academic context is important for their academic achievement in science and mathematics. It also found that academic results of first-year students in science and mathematics at University were a sound predictor for success at the end of their studies. Results from this study confirm the need for universities in multilingual settings to invest in L2 students' English

reading proficiency at the start of their academic programs. Instructional recommendations are made, along with suggestions for further study.

The article that belongs to the Special Issue Academic Contributions to the UNESCO (2019) Forum on Education for Sustainable Development and Global Citizenship research study Reading Habits, Socioeconomic Conditions, Occupational Aspiration and Academic Achievement in Vietnamese Junior High School Students tried to explore students' academic achievement and its association with their reading passion, family socio economic condition, parental education and occupational aspiration. 1676 observations of junior high school students from Northern Vietnam was used for the study. The results show that higher grades are predicted for students who love reading books than those who take no interest in books. Remarkably, the education level of the mother and socio economic level of parents strongly enhance academic performance.

In 2018 Mini conducted a study on Influence of integrated instruction on attitude toward physics and achievement in physics among higher secondary students of Kerala in India and South Carolina in the United States and it was found that a balanced way of integrating both student-centered and teacher-centered strategies made significant positive impact on students' achievement.

Nasimudheen (2016) made an effort to develop an instructional strategy infusing Socioscientific Issue based Instruction and to test its effectiveness on Argumentation and Achievement in Physics of secondary school students. The study shows, Socioscientific Issue based Instruction is highly effective in improving the students Argumentation, which is one of the vital aspects of scientific inquiry. He also points out, socio-scientific issue based instruction

prompt the students to familiarize themselves with use of various theories, inventions and discoveries, the scientific methodology and its linkage with the various social issues that the individual is encountering day by day. The developed instructional strategy using socio-scientific issue based instructional approach is promoting the mindset of the learner to develop their capacity for evaluating the evidences and to make decision concerning controversial issues related with science. The results also revealed that students' achievement in physics is also improved.

Beyessa (2014) tried to explore the factors that affect grade 10 students' academic achievement in science education. The sample was from Ilu Aba Bora Zone of General Secondary Schools. Descriptive survey research method was employed to collect data. There were 360 subjects (172 male and female 155 students, 2 laboratory technicians 25 science teachers, and 6 school principals). Stratified random sampling technique was followed to select the sample students, purposive sampling technique was used to select the schools and availability sampling method was employed for laboratory technicians, science subject teachers and school principals. For the collection of data, questionnaire, observation, interview and document analysis were used. Both quantitative and qualitative methods were used for the analysis of data. The result of the study revealed that traditional methods were adopted for science education, which seldom supported in teaching science education of the modern time. Out of laboratory sessions, with statistically no significant difference between male and female students, and they did not make use of their laboratories and this practice hinder students' understanding to handle science education easily. The study also

revealed that, non-proficiency in English Language is a hindrance for students to grasp the concepts of science education. Lack of parental involvement also made the standard of science education poor and ultimately adversely affected students achievement in science.

Mincy in 2014 conducted a study 'Relationship between attitude towards e-learning and academic achievement' and the study was conducted among higher secondary commerce students of Kozhikode District. It is found that there is positively significant correlation between attitude towards e-learning and academic achievement in commerce and it is true not only for the total sample but also for relevant subsamples based on gender of the students and locality and management category of schools.

Ramya (2014) carried out a study on the 'Effectiveness of multimedia package on achievement in physics and hearing impaired students at secondary level". Test of significance of difference between mean, ANCOVA were the main statistical techniques used. It is found that multimedia package is better than the constructive method for achievement in physics. It is also revealed that multimedia package is more helpful in increasing retention and sustaining interest in physics than constructive method.

'Effectiveness of synectics model in enhancing creative thinking and achievement in biology at secondary level' was the study conducted by Mathews (2014). It is found that the quality in teaching biology and achievement and creative thinking can be improved by using synectics model and it is useful in increasing the retention of knowledge and to develop interest in biology.

John (2014) conducted a study on the effectiveness of mastery of learning strategy on the achievement in physics. The study was carried out among secondary school students. Objectives of the study were to find out whether there existed any difference between mean of pretest scores of the control group and experimental group, to test the whether the difference between mean of post test scores of the control group and experimental group are significant and to test the significance of difference in the mean gain score between experimental and control groups. Preliminary analysis, t-test for mean scores and in order to validate the design ANCOVA were used as statistical means. The major findings were that the performance of the experimental group and control group differ significantly. Again it was found that the performance of the experimental group is higher than that of the control group in the post test. It means that the teaching based on mastery learning is more effective on achievement in Physics than other methods.

Ramesan (2014) in his study "Achievement Motivation, Attitude towards Malayalam and Some Social-Familial Variables Differentiating Between High-, and Low-Creative Underachievers in Malayalam among Secondary School Pupils of Kerala" revealed that Socio Economic Status, Parental Occupation and Parental Income Level differ significantly between High Creative Underachievers and Low Creative Underachievers. It was also found that the Economic Status, Parental Occupation and Parental Income level of High Creative Underachievers is better than that of Low Creative Underachievers.

Roshni (2014) carried out a study, which is titled as 'Effectiveness of collaborative learning and English language achievement at secondary level'.

The main objective of this experimental study was to determine the effectiveness of collaborative learning in learning of English among secondary school students. Test of significance of difference between mean and ANCOVA were the statistical techniques used. It is found that the pupils taught by collaborative learning have better academic achievement in English than those taught by constructivist method.

The study "Parental Influence and Academic Achievement among Middle School Students: Parent Perspective" conducted by Lam and Ducreux (2013) revealed the effects of academic achievement and parental influence on middle school students. The sample consisted of 32 parents of students studying in middle school. Data related to Parental help, Parental pressure and support, monitoring and press for literacy and communication was collected. There was a significant relationship between communication and academic achievement: higher the ability of students in communication better is their academic achievement. It was also revealed that the higher the level of education of parents, the more was their involvement in their children's studies.

Beevi in 2012, carried out a study related to co-operative learning method on achievement in mathematics. The study was conducted among high school students. The statistical techniques used were Preliminary analysis, significance of difference between mean etc. It was found that compared with conventional method, co-operative learning method is more effective on achievement in mathematics in the case of high school students.

Reshmy (2012) tried, in a study, to find out the relation between self concept and academic achievement among secondary school students of

Malappuram district in Kerala. The study was framed to find out both the level of self concept and the level of academic achievement in science among secondary school students. It was also intended to find out the relationship between self concept and achievement in science not only for the total sample but for the relevant subsamples based on gender, locality and type of management also. It was found that the relationship between self concept and academic achievement in science is negligible and positive for the total sample and the subsamples. Again it was found that there is significant difference in the relationship between self concept and academic achievement in science of secondary school students for the subsamples based locality, management category of schools but there was no significant difference between boys and girls.

Manjusha (2012), conducted a study to find out the relationship between problem solving ability and achievement in mathematics. The sample was secondary school students of Thrissur district. It was intended to find out whether there existed any difference between problem solving ability and the achievement in mathematics among secondary school students of Thirssur district for the total sample and subsamples based on gender, locale and type of management of the schools. It was revealed that the relationship between level of problem solving and the achievement in mathematics among secondary school students are positive and significant for all the cases. There is significant difference in the relationship between problem solving ability and achievement in mathematics among secondary school students with respect to the category of management of the school but there is no difference in the problem solving ability and achievement in mathematics among secondary school students for subsamples boys and girls and for subsamples based on locale.

In a study on the role between meta cognitive ability and academic achievement in chemistry among higher secondary school students in Wynad district conducted by Nisha (2012), it has been pointed out that meta cognitive ability of girls is more than that of boys and there exists significant difference in the meta cognitive ability between rural and urban and government and aided higher secondary school students.

Ali (2007) conducted 'A study of psychological factors affecting the achievement in English Grammar at the secondary level' and revealed that it is the level of aptitude, interest and intelligence and not gender, locale and type of management of schools which influence the achievement in English grammar.

Saravanakumar and Mohan (2007) made an experimental study on enhancing students achievement in science through metacognitive orientation. This study aims at developing appropriate strategies to enhance the level of metacognitive orientation towards enhancing students' achievement in science.

Dwivedi (2005) studied the Influence of the School Environment and Approval Motive on Academic Achievement of Students. Objectives of the study were related to the comparison of the educational attainments of students belonging to different categories of schools and their environment and the observation of the variability of achievement between high approval seekers and low approval seekers. The data analysis was done using F-ratios. The findings of the study are (1) Enriched environment had significant influence on academic achievement, the students who enjoy better environment have higher academic achievement than the students from poor school environments. (2) High approval seekers have significantly greater achievement than the low approval seekers.

(3) Students of the urban schools have significantly higher academic achievement than that of the rural school students.

'Constraints in the education of the tribal pupils of Kerala' was a study conducted in 2005, by Mercy. The general objective of the study was to identify the constraints in the education of the scheduled tribe pupils of Kerala. Documentary analysis, survey method and participant observation were used as statistical techniques. The findings of the study revealed that though there is not much difference in the enrolment rate of the boys and girls after 90's there was a downward trend in enrolment rate and the dropout rate is higher than that of general population and it is greater in primary levels compared to secondary levels. The attitude of the tribal parents and the inefficiency of the teachers are the main reason for this.

Sahu and Sood (2005) studied the Impact of the students Perception about their Teachers' Attitude towards them and its Relationship with their Academic Achievement. Objectives were to find out the relationship between students' perception of their teachers' attitude towards them and their academic achievement. The study was also aimed to find out relationship between students' perception of their teachers' attitude towards them and their self perception; and to estimate the extent of relationship between academic achievement and self-perception of the students. The sample of the study was students of class VII and simple random sampling technique was used. The findings revealed that there exists a significant relationship between perception of the students and teachers' attitude towards them and their academic achievement. It was also found that there exists a significant relationship between students' perception of teachers' attitude

and self-perceptions of students. There was a significant relationship between the academic achievement and students' self-perception.

Prakash and Patnaik (2005) carried out a study to find out whether Co-operative Learning has any effect on Achievement Motivation and students Achievement in Biology. The objectives framed were aimed to find out the effect of co-operative learning on both the achievement motivation and students' achievement in biology. Methodology: From 3 schools a sample of 200 students was selected for the study. Out of them 100 students were experimental group and 100 students were treated as control group. The students of both the groups were made equivalent and matched by pairing their intelligence and Biology scores in achievement. Findings were that there was positive correlation between co-operative learning and achievement motivation, Co-operative learning and achievement in Biology in three levels, knowledge, understanding and application and in total achievement.

Using normative testing survey method and cross-sectional approach for collection of the data Sindhu (2005) studied the Academic Achievement of students due to Teachers' Motivation and Student Adjustment. 680 Standard X students and 32 teachers were selected from the Kendriya Vidyalayas. Stratified random sampling technique was used for the survey. According to the findings of the study both the male and female teachers show average or above average level of motivation towards their work, most students showed average and above average adjustment with school environment, the adjustment of girls displayed superiority as compared to the boys, the girls showed more affection for their teachers than the boys'. There was no significant difference between boys and

girls in their achievement. There was only, low positive correlations between students' liking for their teachers and their adjustment, and better the liking of teachers higher the contribution towards achievement of boys.

"Development of an instructional strategy based on Vygotsky's approach for teaching basic mathematical concepts at the primary level"– was the study carried out by Sreeja in 2005. She found that the three instructional strategies developed for teaching the basic mathematical concepts decimals, average and negatives for standard V, VI and VII are more effective than the then existing conventional methods of teaching and it is validated by statistical techniques effect size, test of significance of difference between means, gain score analysis and analysis of covariance.

Vamadevappa (2005) conducted a study to find out the Effectiveness of Parental Involvement on Academic Achievement. The sample for the study was Higher Primary Students. The objectives framed were to find out the relationship between parental involvement and academic achievement among students. Again it was intended to find out the difference between high achievers and low achievers with regard to parental involvement. The investigator also wanted to find out the difference on academic achievement between boys and girls and to find out the difference between boys and girls on low parental involvement and high parental involvement. The sample consisted of 200 students studying in 6th standard of 100 boys and 100 girls. It was selected through random sampling technique from four higher primary schools. The relationship between parental involvement and academic achievement was found out using Pearson's product moment correlation technique. The significance of difference between the means

of two groups was found out by 't' test. The findings of the study revealed that (1) positive and significant relationship exists between parental involvement and academic achievement. (2) Significant difference exists in the achievement scores of boys and girls of group having high parental involvement. (3) No significant difference in the achievement scores of boys and girls having low parental involvement group. (4) High achievers and low achievers showed that there exists significant difference with respect to parental involvement. (5) The academic achievement between boys and girls showed significant difference.

Mohanty (2002) conducted a study on the perception of Gifted Underachievers' of their Family Environment. Objectives were to find out the relationship of the components of family environment with academic achievement of gifted underachievers. It was also intended to find out gifted underachievers' achievement pattern with respect to family environment and to find out whether a gender difference exists in gifted underachievers' perception about the family. Again to find out the extent do the components of family environment variable contribute to the prediction of academic achievement in the case of gifted underachievers, jointly or singly. The findings of the study revealed that the mean score of boys was higher than the mean scores of girls, boys scored higher on Active Recreational Orientation, Moral and Religious Emphasis Cohesion, Intellectual Cultural Organization, and control components of FES, while the girls scored higher on achievement orientation, organisation components of FES and conflict,. In totality, all components of FES except Active Recreational Organisation was significantly related with underachievers' academic achievement. There was no significant correlation between component

of FES and academic achievement for underachieving boys. But in the case of underachieving girls Independence, Cohesion, and Control components of FES were found to have significant correlation with academic achievement. Independence and Control were related negatively while Cohesion was related positively. It was also showed that among all the sub-scales the powerful predictor of academic achievement was only Independence.

Gafoor (2001) studied the Influence of parental variables and its relation to academic achievement. The study was conducted on a representative sample of elementary school pupils of Kerala. The Hypotheses framed were that there will be relationship between academic achievement for the total sample and subsamples based on gender and each of the parental variable such as socioeconomic status of the pupils and locale and type of management category of the school. It was also taken into account that there will be significant difference in the relationship between academic achievement and of each of the parental variable with of the all subsamples based on sex, and socioeconomic status of the students and locality of school and type of management of the school and also the predictor (parental) variable and criterion variable academic achievement will be significant and hence academic achievement can be predicted from parental variables. Again the another hypothesis was that the efficiency of the significant parental variables in predicting student's academic achievement will be different and also there will be different levels of the parental variables and based on this there will be significant difference in the mean scores of academic achievement of the elementary school pupils. Two tailed test of significance of difference between means, Pearson's product

moment coefficient of correlation, the coefficient of contingency correlation, Test of significance of difference between correlations, stepwise regression analysis (ANOVA approach) and the multiple correlation and the calculation of coefficient of determination R^2 were the Statistical techniques used.

The result shows that, 20 out of 21 parental variables in the total sample have significant relation between Academic Achievement. The relationship between most of the parental variables and academic achievement are significantly different high average and low SES (socio economic status) pupils for boys and girls, rural and urban students. It is also found that one or more of the parental variables can predict academic achievement. Based on different levels of parental involvement such as, father's education, mother's education, fathers and mothers employment and parental income there is significant difference in the academic achievement of elementary school pupils. Mother's absenteeism is more significant effect on academic achievement than that of father's.

Abdul Kader (2000) conducted 'A study on the stress and professional efficiency of the heads of primary schools in Kerala'. Objectives were to compare the mean scores of stress and professional efficiency for the selected subsamples based on sex, age, educational qualification teaching experience, and marital status of the heads of primary schools in Kerala, to study the levels of stress experienced by the heads of the primary schools in Kerala, to compare the percentages of the heads of primary schools in Kerala experiencing different levels of stress for selected subsamples based on sex, age, educational qualification teaching experience and marital status of the heads of primary schools in Kerala, to compare the percentages of heads of primary schools in

Kerala experiencing different dimensions of stress for selected subsamples based on the basal variables of the study and to examine whether any association exists between each of the basal variable and stress experienced by the heads of primary schools in Kerala and each of the basal variable and professional efficiency of the heads of primary schools in Kerala, to find out the relation between stress and personal efficiency of the heads of the primary schools in Kerala for the total samples and subsamples, to compare the relationship between stress and professional efficiency of the heads of primary schools in Kerala for the comparable subsample, to identify the most effective subset of the dimensions of stress which can predict the professional efficiency of the heads of primary schools in Kerala, to find whether the variance, covariance structure of stress and professional efficiency of the heads of primary schools in Kerala can be expressed through linear combinations of dimensions of stress and professional efficiency, to find out whether significant association exists between the set of dimensions of stress and the set of dimensions of personal efficiency of the heads of primary schools in Kerala. Hypotheses were framed in accordance with the objective of the study. Test of significance for difference between means, estimation of percentages for total stress and dimensions of stress, test of significance for difference in percentages, Biserial coefficient of correlation to find out the association between dichotomized variables and the variables of the study, Chi-square test to find the associations between educational qualification and variables of the study, correlation analysis using Pearson's product moment method, Test of significance for difference between the r's, Multiple linear regression analysis, were the statistical techniques used. The findings of the study revealed that, the heads of the schools do experience different levels of

stress. But the impact of stress on their professional efficiency is hardly evidenced. The marital status and the professional efficiency also have no correlation. The subset dimensions of stress 'social and familial factors' and 'occupational factors' are the best subset to predict the Professional Efficiency of the heads of primary schools in Kerala.

Rani (1996) conducted a study related to the creativity of High School Pupils in Learning the English Language. The main objectives of the study were to find out the relationship between achievement in English and different levels of creativity and the relationship between nonverbal and verbal creativity. It is found that there is no significant relation between pupils achievement in education with different levels of creativity and It is also found that there is significant relationship between nonverbal and verbal creativity.

"Relationship of some selected correlates of achievement motivation with different dimensions of cognitive ability of IXth standard students in chemistry' was the study conducted by Ida Nancy in 1994. The main objective of the study was to develop a multiple regression equation for predicting cognitive ability in chemistry in terms of a few selected independent variables which correlate highest with the cognitive ability by ANOVA approach. Pearson's product moment coefficient of correlation, interpretation r, Verbal description of r, Confidence intervals, Shared variance, Stepwise regression and Test of significance of difference between means of large independent samples were the statistical techniques used. The findings showed that, "cognitive ability in chemistry" can be predicted best when seven of the predictor variables put together. They are given in the reverse order of their importance: (1) Socio-familial variables, (2) Level of

aspiration, (3) Study habits, (4) Intelligence, (5) Family cultural level index, (6) Socio-economic status and (7) Home learning facility.

Nirmaladevi conducted a study "The effect of certain social –familial variables on some representative convergent thinking and divergent thinking abilities of secondary school pupils" in the year 1993. The hypotheses framed were that significant mean difference in depended variables (convergent thinking and divergent thinking variables) exist when the 5 groups, very low, low, medium, high, and very high formed on the basis of independent variable (social familial variables) are compared and significant and positive correlation exists between each of the independent variable with each of dependent variable. The statistical techniques used were Pearson's product moment coefficient of correlation, test of significance of difference, Analysis of variance (one-way) and Scheffés F-test. The findings of the study revealed that there is significant difference obtained in the case of seven social familial variables except family environment. Further out of eight there exists significant relationship between five social- familial variables and divergent thinking. The parents educational level were found to have a remarkable effect on the creativity and intellectual ability of all pupils.

Agarwal (1986) studied the effect of parental encouragement and the educational development of students. The sample was secondary school students. It was found that the high achieving group of students enjoy higher encouragement from their parents.

Yadav (1986) conducted research on "correlation among IQ, age, academic achievement and parental income of science students of high school. It

is found that there is a significant relation between achievement of students and income of their parents.

Gayatri (1985) in her study investigated parent's interest and its influence on children's academic achievement at middle school level and found that there is a Significant relationship between students' academic achievement and the aspiration of their parents.

In 1984, Nair conducted a study in University of Calicut, Department of Education on the 'Factors related to unachievement in biology of social science students'. The study was aimed to find out the effect of the following personality variables on unachievement in biology students of secondary school in terms of their Attitude towards various dimensions, to find out whether there is any significant difference in the proportion of non achievers when extreme groups are taken on the basis of intelligence in biology and to find out if there is any significant difference in the proportion of non achievers, when extreme groups are taken on the basis of any one of the social variable selected for the study, in biology. Statistical techniques used were identification of different achievement levels, regression equation with verbal intelligence as the aptitudinal criterion, regression equation with non verbal intelligence as the aptitudinal criterion and under achievers, normal achievers and over achievers were decided by plotting graphs and test of significant difference and test of significant for difference between proportions. Findings of the study revealed that with regard to personality variables there is significant difference between underachievers and achievers of other levels in biology is fully substantiated except in the case of non achievers and under achievers.

Devi 1984 on a comparative study of high-, average-, and low-creative secondary school pupils found that familial variables Mother's educational level, Father's income level, Home learning facility and Father's educational level are capable to discriminate the different groups in accordance with their creativity.

Mohamed conducted 'A Diagnostic Study of Errors in Written English of Pre-degree Students' in 1983. The study was intended to identify the major errors committed by pre-degree students in their written English, to classifying and arranging the major areas in the order of their importance by studying the relative proportion of the error, to determine the sources of identified errors, and to suggest for remedial programs and corrective measures. There were three categories of variables, which include Institutional variables, (1. Locale 2. Type of the management 3. Academic standard. 4. Grade 5. Sex enrolment nature), Educational variables (1.Optional subjects studied. 2. Management of the school level. 3. English language achievement 4. SES 5. Discrepant achievement)., and Personal variables (1. Domestic facilities for learning English, 2. Gender.) The significant influence will be indicated by, a. The difference in the incidence of errors for the sub groups b. The difference in the mean scores of errors for the sub groups and the proportion of errors in the written English of an unselected sample of primary division pupils will have negative significant correlation with each of the following select variables such as English language achievement, Intelligence, SES and Domestic facilities for learning English. Tests of significance of difference in percentages, Critical ratio C.R. in mean scores of errors were the statistical techniques used. The findings of the study is that 82.28 percent the total sample commits errors in almost all the grammatical areas

mainly in the use of tenses and at the least 25.71 in the use of pronouns. The socioeconomic status affect considerably the percentage of errors. lower the socioeconomic status of the student higher the percentage of the error and it is due to the fact that those students who have higher socioeconomic group have higher facilities for learning.

Sarkar (1983) found that the high achievers and low achievers have a significant difference between parent-child relationship.

Walberg (1983) showed that the influence of parental involvement in education directly proportional to academic achievement.

Chopra (1982) has seen that the socio-economic status of the parents has a positive correlation with academic achievement of the children.

Rajalakshmi (1982) in her study found that scheduled castes and scheduled tribes have not yet come up to the level of forward communities in educational achievement despite the financial assistance given to them for quite a long period.

Sivadasan conducted a study on 'Linguistic Experimentation in Contemporary Indian Verse in English – A Study in Comparative Stylistics' in 1982. From this study, he points out that the only way in which the lovers of literature get access to the best literature available in regional languages are when Indian literatures are being translated into English and reviewed. But the regional literature is composed in the regional tongue. The works translated in to English from the regional languages may serve only as a medium to understand the Indian literature in its totality.

Beryl's (1981) work revealed that parents involvement and mathematics achievement have a positive correlation.

Smith (1981) in his study found that there is a positive relationship between parental attitudes and academic achievement of children.

Baseve (1980) studied the relation of parental behaviour to achievement. It is found that in the case of females, punishing mother was found positively related with academic achievement. But for males, the support of mother was found to be positively related to achievement.

Venkataish (1980) in his study found that the academic achievement of both arts and science students were positively related to their socio- economic status.

Grover (1979) conducted a study on parental aspiration as related to personality and school achievements of children. He found a positive correlation between father's and mother's aspirations.

Jean (1979) studied the relation between parental Support for teacher's objectives and student's mathematics achievement. He found that the students got high achievement scores whose parents actively involved in the child's academic work.

Salunke (1979) found that economic management was related with academic achievement and socio-economic status is not related with academic achievement. Educational happiness and emotional facilities in the home have positive contribution to the academic achievement of students.

Deo and Ahuluwalia (1978) conducted a study to find out Relation between socio-economic status and academic achievement. The sample used was high school students. It is found that the correlation between socio-economic status and academic achievement is very low.

Jones (1978) traced parental factors affecting pupils achievement and found that there is a relationship between the attitude of parent towards education and children's reading achievement.

Srivastava (1978) conducted a study on the effects of family anxieties on educational achievements concluded that the achievement of students is negatively related with the parent’s indifferent attitude towards education.

Tucker (1978) studied the effect of parental influence in the development of achievement behaviour in adolescence. He found that Parental behaviour influence the academic achievement of students.

Constantine (1978) conducted a study and it is found that parents attitude towards child rearing does affect the student’s study habits, study attitudes, study skills and achievement.

Khan (1976) has studied the effect of parental deprivation on personality adjustment and found that parental deprivation had a differential effect on the achievement of students.

Martha's (1976) study on parental attitude about mathematics education revealed that there is a strong and significant correlation between parental attitude and student achievement.

Lalithamma (1975) conducted a study on some factors affecting achievement. The study showed that achievement in mathematics was positively correlated to intelligence, study habits, interest in mathematics, socio-economic status etc.

Abraham (1974) conducted a study related to achievement in English of secondary school pupils. Achievement in English and intelligence were used as a basis for classifying the sample into over achievers, normal achievers and under achievers. It was revealed that many of the over achievers had higher level of intelligence. The other factors such as attitude towards English, personal and social adjustment and socio economic status were also associated with achievement level.

Dhami (1974) found that the relationship between scholastic achievement and socio- economic status was statistically significant but was not very high.

"A study on creativity, intelligence and academic achievement" is a study conducted by Paramesh (1973). The objectives framed was intended to trace the relationship between achievement in English, Mathematics, Science, Geography, Vernacular, and creativity. Annual examination marks and Wallach and Kogan's creativity test were taken to determine students' academic achievement. Findings revealed that there is no significant relationship between achievement in different school subjects of students and their creativity.

Whiting (1973) investigated the relationship of child rearing practices to school achievement. Her findings showed that the parents of successful boys

expected independence and mastery of tasks did earlier than the parents of unsuccessful boys.

Comber and Keeves (1972) in the book Science education in nineteen countries point out that in India the girls at school at each of the three population levels are likely to be more able on the average than the boys. Consequently, the girls are likely to perform above the boys on tests of general ability and possibly also of achievement.

Rotter (1972) in the book Application of a social learning theory of personality explores relationship between parents attitude and behaviours and their early-grade-school age children's academic performance. It is found that the parents attitude and behaviours (both general and specific) were associated with their daughters performance on the scholastic achievement test much more frequently than those of their sons.

Menon (1972) while comparing the personality characteristics of over-achievers and under-achievers found that parental attention is related to high-achievement.

Finlayson (1971) observes that parental aspirations which are products of a highly complex dynamic social Process, are the casual factors of children's achievement.

Raina (1968) investigated into verbal and nonverbal creative thinking ability. This was a study in sex differences. The objective was to study the influence of sex differences in creative functioning of teachers. Torrance’s test of

creativity thinking was used. Findings showed that there is no significant difference in verbal creativity of males and females and they differed significantly on originality aspect of nonverbal creativity.

Conclusion

From the foregoing review of literature it is clear that researches concerned with academic achievement related with language, science, social science, mathematics, computer science are not sparse. Researchers have been searching for the root causes for the different levels of achievement such as under, low, average, high etc., and whether attitudes of parents, teachers, peers, influence of environment such as rural or urban, type of management of school, etc individual factors like sex, intelligence, creativity, study habits etc will affect the achievements of the students. These are areas of paramount importance as far as subjects of research and the realm of academic performance of the teacher and taught are concerned. Higher level of scholastic achievement is the most important and cherished desire of the students, teachers and parents as well. Homely factors such as education, occupation, socioeconomic status of the parents also will affect the academic achievement of the students along with individual factors. Eradication of the root causes of poor academic performance which in turn will enable the student towards better performance is the most welcomed fact which will ultimately decide the future of the individual, society and nation. But the searching of literature studies revealed that studies concerned with whether achievement in one subject will affect the achievement in other subjects and if it affects in which direction, are rare. The two year B.Ed

programme as envisaged, delineated and executed by NCTE gives enough opportunities for language learning. The importance given to language learning especially to English language in the curriculum of B.Ed will surely have its reflections in the achievements of coming generation. Hence the researcher is interested to find out whether proficiency in English and homely factors of the students have any significant influence on the achievement in science subjects and in which direction it will affect and hence this study was conducted.

METHODOLOGY

- Design of the Study
- Variables of the Study
- Tools Employed
- Administration of the Tools
- Sample Selected for the Study
- Scoring and Consolidation of Data
- Statistical Techniques Used for Analysis

METHODOLOGY

Research methodology is a systematic procedure to solve a research problem. It gives a clear idea of the various steps followed by the researcher and the logic behind the procedure. The present study is an attempt to find out the Influence of Proficiency in English and Selected Contextual Factors on Achievement in Physical Science of Standard IX Students.

The methods and procedures followed are the determining factors of the adequacy, appropriateness and accuracy of results of any research work. This chapter presents a detailed description of variables, tools employed, selection of sample, data collection procedure and consolidation of data and statistical techniques used for analysis.

Design of the Study

Design of the study refers the type of the study and it also defines the structure and plan of the research area with the adopted strategies and formulated objectives. The present study was conducted to find out the Influence of Proficiency in English and Selected Contextual Factors on Achievement in Physical Science of Standard IX Students. Considering the nature of the problem, the investigator selected quantitative research method and adopted survey as the method for collection of data.

Variables of the Study

The study has been designed with “Achievement in Physical Science i.e. Achievement in Physics and Achievement in Chemistry as dependent variables and Proficiency in English and Selected Contextual Factors such as Socio-economic Status and Parental Support as independent variables.

Tools Employed

In an investigation, the selection of appropriate devices or tools required for the collection of data is an important aspect which determines the authenticity of the study. For the present study, the investigator has used the following tools for the collection of data.

1. Achievement Test in Physics for standard IX students (Gopalakrishnan & Naseema, 2018).
2. Achievement Test in Chemistry for standard IX students (Gopalakrishnan & Naseema, 2018).
3. Proficiency Test in English for standard IX students (Gopalakrishnan & Naseema, 2018).
4. Socio-Economic Status Scale (Gopalakrishnan &Naseema, 2018).
5. Questionnaire on Parental Support (Gopalakrishnan & Naseema, 2018).

Detailed description of each of these tools is given below:

1. Achievement Test in Physics for Standard IX Students

This test was developed by the investigator with the help of supervising teacher. It was intended to measure the Achievement in Physics of students studying in standard IX. The test had covered most of the concepts in Physics included in the first and second chapters of Physics Standard IX Part-1 Text Book of government of Kerala. The test consisted of 60 objective type questions, all of which were ‘multiple choice’ type items.

Construction of the test

The test was constructed in accordance with the procedure for preparing standardized Achievement test in Physics. But because of difference in purpose and scope, slight modifications were made in the design of the test.

In the test of Achievement in Physics, it was decided to follow the Bloom's Taxonomy of Educational Objectives (Bloom, 1979) for item construction. The three levels of objectives under cognitive domain namely Knowledge, Comprehension, Application, were included in the test. Each category of objectives was defined and test items were prepared according to the different abilities specified under each category. The weightage assigned for various objectives has been presented in Table 1.

Table 1

Weightage to Objectives in the Test of Achievement in Physics

Sl. No.	Objectives	Percentage	Marks
1.	Knowledge	27*	16
2.	Comprehension	40*	24
3.	Application	33*	20
	Total	100	60

*Approximate percentage

The test was prepared for administering it within two months after the commencement of the first academic term. So only the first and second chapters of Physics in Standard IX Part-I Text Book of Government of Kerala, Department of Education were selected for preparing the Achievement Test. The objectives selected can be verified only through content. Hence for the evaluation of the objectives in the cognitive domain weightage was given accordingly.

While choosing the content, equal consideration was given to the first and second chapter and it is given in Table 2.

Table 2

Weightage to Content in the Test of Achievement in Physics

Sl. No.	Content	Percentage	Marks
1.	Chapter 1: Forces of Fluids	50	30
2.	Chapter 2: Motion and Laws of Motion	50	30
	Total	100	60

Table 3

Blue Print of the Draft Test of Achievement in Physics

Sl. No	Content / Objectives	No. of Items Under the Objectives			Total
		Knowledge	Comprehension	Application	
1	Chapter 1: Forces of Fluids	8	12	10	30
2	Chapter 2: Motion and Laws of Motion	8	12	10	30
	Total	16	24	20	60
	Percentage	27*	40*	33*	100

*Approximate percentage

Item writing

After fixing up the contents related to physics to be included in the test the investigator started writing the specific items. Proper care was taken in wording the items of the test to be as simple and direct as possible. The four distracters of each item framed were based on first and second chapters of Physics Standard IX Part- 1 Text Book.

There was only one correct answer for each item. The students had to put a ('x') mark on the correct response in the response sheet which was additionally prepared and distributed. Personal details such as the name of the school, gender and locale of the school were also asked for them to write in the response sheet.

For the present study, items were prepared giving importance to cognitive domain of Bloom's taxonomy. The major categories under the cognitive domain were knowledge, comprehension, and application. Limpidity, precision and appropriateness of the items were considered while developing the test items.

Illustrative item for each objective is given below:

Knowledge

The knowledge level items measure the student's ability to recall or recognize information. This involves the recall of specifics and universals, the recall of methods and procedures or the recall of pattern, structure or setting.

Example: What is the unit of momentum?

a. kg x ms b. kgm/s c. kgs/m d. sm/kg

Comprehension

Comprehension involves largest general class of intellectual abilities and skills. It refers to a type of understanding or apprehension such that the individual knows what is being communicated and can make use of material or idea being communicated, relating it to other material or seeing its fullest implications.

Example: What is the relation between action and reaction?

a. Both are equal

b. Both are equal and in same direction

c. Both are equal and in opposite direction.

d. Both are in opposite direction

Application

Application is the use of an abstract idea in a particular and concrete situation and there by arriving at a solution of a problem. The abstraction may be in the form of general ideas, rules of procedures or generalized methods.

Example: Force is applied for 2 seconds to a body with mass 10kg. What will be the force applied if its velocity is increased to 2m/s from rest.

a.10 kg b. 10 kg/s c. 10N d. 20N

The investigator had written and pooled initially 80 items as per the pre-planned design. According to the suggestions of the supervising teacher and experts in the field, some items were rejected and some were modified. Hence the final form of the test was reduced to 60 items.

Out of the total 60 items the Knowledge level included 16 items, the Comprehension level included 24 items and Application level included 20 items.

Pilot testing

To have an estimate of time and to check whether there was any ambiguity in the item, a pilot test was administrated to a randomly selected

students, comprising of 15 boys and 15 girls of standard IX, in the M.S.P. school, Malappuram. Besides the written directions given in the test, oral instructions were also given to the students.

Pilot-test was also used for screening out discrepancies crept in the construction, assembling of test items, in the instruction given, and also detecting the ambiguity of the distracters. After pilot- testing the test was again edited and the final test was prepared in a booklet form, along with the response sheet. The scoring key was also prepared. The draft test in Malayalam and in English and response sheets are given as Appendices I, II and III respectively.

Item Analysis

The process of examining the students responses to each test item in order to judge the quality of the item is called item analysis. The two qualities by which the individual item were judged are discrimination power and difficulty level. The procedure suggested by Ebel (1972) was adopted for this purpose.

The 100 response sheets of Achievement test in Physics in the upper group and 100 response sheets of each of the tests in the lower group were selected for item analysis. On the basis of total score obtained, the answer sheets were arranged in descending order. From this arranged sheets two such groups were separated as upper group consisting of 27% of those who got highest scores for the test and lower group of 27% who received lowest scores i.e. 100 in each group.

Difficulty Index (D.I)

The difficulty index of an item is represented by the percentage of the students who respond correctly each item. So the difficulty index was calculated using the formula

$$\text{Difficulty Index} = \frac{U + L}{2N}$$

Where,

U = Number of correct responses in the upper group

L = Number of correct responses in the lower group

N = Number of score sheets in the upper or lower group

Discriminating Power (D.P)

The discriminating power of an item refers to the quality of an item to discriminate between students with high and low ability. It was calculated using the formula

$$\text{Discriminating power} = \frac{U - L}{N}$$

Where,

U = Number of correct responses in the upper group

L = Number of correct responses in the lower group

N = Number of score sheets in the upper or lower group

Data and results of Item Analysis of Achievement Test in Physics for Standard IX are given in Table 4.

Table 4

Details of Item Analysis of Achievement Test in Physics for Standard IX

Sl. No.	U	L	DI	DP	Item Selected/ Rejected	Sl. No.	U	L	DI	DP	Item Selected/ Rejected
1	79	46	.62	.33	Selected	31	71	24	.47	.47	Selected
2	57	30	.43	.27	Selected	32	95	36	.65	.59	Selected
3	31	25	.28	.06	Rejected	33	91	27	.59	.64	Selected
4	69	34	.51	.35	Selected	34	51	14	.32	.37	Selected
5	35	16	.25	.19	Rejected	35	56	17	.36	.39	Selected
6	40	14	.27	.26	Rejected	36	70	23	.46	.47	Selected
7	28	17	.22	.11	Rejected	37	77	27	.52	.50	Selected
8	47	22	.34	.25	Rejected	38	17	16	.16	.04	Rejected
9	85	28	.56	.57	Selected	39	40	20	.30	.20	Rejected
10	39	17	.28	.22	Rejected	40	76	25	.50	.51	Selected
11	50	35	.42	.15	Rejected	41	96	40	.68	.56	Selected
12	58	19	.38	.39	Selected	42	62	24	.43	.38	Selected
13	52	16	.34	.36	Selected	43	85	28	.56	.57	Selected
14	32	27	.29	.05	Rejected	44	40	14	.27	.26	Rejected
15	38	19	.28	.19	Rejected	45	61	22	.41	.39	Selected
16	76	33	.54	.43	Selected	46	53	22	.37	.31	Selected
17	39	26	.32	.13	Rejected	47	34	23	.28	.11	Rejected
18	44	33	.38	.11	Rejected	48	43	23	.33	.20	Rejected
19	47	17	.32	.30	Selected	49	12	14	.13	-.02	Rejected
20	38	19	.28	.19	Rejected	50	54	26	.40	.28	Selected
21	58	25	.41	.33	Selected	51	86	34	.60	.52	Selected
22	90	40	.65	.50	Selected	52	88	33	.60	.55	Selected
23	49	25	.37	.24	Rejected	53	60	11	.35	.49	Selected
24	82	33	.57	.49	Selected	54	82	32	.57	.50	Selected
25	43	22	.32	.21	Rejected	55	55	31	.43	.24	Rejected
26	30	20	.25	.10	Rejected	56	9	22	.15	-.13	Rejected
27	86	37	.61	.49	Selected	57	46	21	.33	.25	Rejected
28	79	28	.53	.51	Selected	58	60	37	.48	.23	Rejected
29	27	12	.19	.15	Rejected	59	85	45	.65	.40	Selected
30	91	27	.59	.64	Selected	60	76	25	.50	.51	Selected

After item analysis, 34 items were selected for the final test.

Validity of the Achievement Test in Physics

Validity of the test is the accuracy with which the test measures what it intends to measure. The test was prepared based on the Two chapters of IXth standard text book in Physics and hence the investigator claims content validity for the test.

Reliability of the Achievement Test in Physics

The reliability of the test was found out by Split half method. The correlation between scores on the odd and even numbered items of final test of 100 sample were scored separately. The correlation between scores on the odd-and even numbered items was calculated using Pearson's Product Moment Coefficient of Correlation method to find the reliability of the half-test. From this the reliability of the whole test was found out by Spearman Brown Prophecy formula.

$$r = \frac{N\sum XY - \sum X \sum Y}{\sqrt{\left[N\sum X^2 - \left(\sum X\right)^2\right]\left[N\sum Y^2 - \left(\sum Y\right)^2\right]}}$$ (Best & Kahn, 2006)

Where 'X' is the score of odd items and 'Y' is the score of even items, and 'N' is the number of total items.

To obtain an estimate of the reliability based on the full length test the following Spearman Brown formula was applied.

$$r_{xx} = \frac{2r_s}{1+r_s}$$ (Ferguson, 1976)

Where

r_{xx} = correlation coefficient of full length test

r_s = correlation coefficient of half test

The value of r_{xx}, i.e., the full length correlation coefficient of the test is 0 .82. This index suggests that the test is highly reliable to measure the achievement in physics of standard IX students.

Table 5

Weightage Obtained for the Content and Objectives in the Final Test of Achievement in Physics

Sl. No.	Content	No. of Items Under the Objectives			Total
		Knowledge	Comprehension	Application	
1.	Force of Fluids	5	8	6	19
2.	Motion and Laws of Motion	4	6	5	15
	Total	9 (27%*)	14 (41%*)	11 (32%*)	34

*Approximate percentage

The number of test items selected for Physics after item analysis was 34. The standardized tool for testing Physics, its English translation, response sheet and scoring key are given as Appendix IV, V, VI and VII respectively.

2. Achievement Test in Chemistry for Standard IX Students

The test was developed by the investigator with the help of supervising teacher. The test was prepared for administering it within two months after the commencement of the first academic term. It was intended to measure the Achievement in Chemistry of students studying in standard IX. The test had covered most of the concepts in Chemistry included in the first and second chapter of Chemistry Standard IX Part-I Text Book of government of Kerala. The test consisted of 60 objective type questions, all of which were 'multiple choice' type items. The test was prepared both in Malayalam and in English.

Construction of the test

The test was constructed in accordance with the procedure for preparing standardised Achievement Test in Chemistry. But because of difference in purpose and scope, slight modifications were made in the design of the test.

It was decided to follow the Bloom's Taxonomy of Educational Objectives (Bloom, 1979) in the test of Achievement in Chemistry, for item construction. The three levels of objectives under cognitive domain namely Knowledge, Comprehension, Application, were included in the test. Each category of objectives was defined and test items were prepared according to the different abilities specified under each category. The weightage assigned for various objectives has been presented in Table 6.

Table 6

Weightage to Objectives in the Test of Achievement in Chemistry

Sl. No.	Objectives	Percentage	Marks
1.	Knowledge	27*	16
2.	Comprehension	40*	24
3.	Application	33*	20
	Total	100	60

*Approximate percentage

The objective selected can be verified only through content. Hence for the evaluation of the objectives in the cognitive domain, the first and second chapter of Chemistry Standard IX Part-1, Text Book of Government of Kerala were selected and weightage was given accordingly. While choosing the content, equal consideration was given to the first and second chapter and it is given in Table 7.

Table 7

Weightage to Content in the Test of Achievement in Chemistry

Sl. No.	Objectives	%	Marks
1.	Chapter 1: Structure of Atom	50*	30
2.	Chapter 2: Chemical Bonding	50*	30
	Total	100	60

* Approximate percentage

Table 8

Blue Print of the Draft Test of Achievement in Chemistry

Sl. No.	Content / Objectives	No. of items under the objectives			Total
		Knowledge	Comprehension	Application	
1	Chapter 1: Structure of Atom	8	12	10	30
2	Chapter 2: Chemical Bonding	8	12	10	30
	Total	16	24	20	60
	Percentage	27*	40*	33*	100

*Approximate percentage

Item writing

After fixing up the contents related to chemistry to be included in the test the investigator started writing the specific items. Proper care was taken in wording the items of the test to be as simple and direct as possible. The four distracters of each item framed were based on first and second chapters of Chemistry, Standard IX Part- 1 Text Book.

There was only one correct answer for each item. The students had to put a ('x') mark on the correct response in the response sheet which was additionally prepared and distributed. Personal details such as the name of the school, gender and locale of school were also asked to write in the response sheet.

For the present study, items were prepared giving importance to cognitive domain of Bloom's taxonomy. The major categories under the cognitive domain were knowledge, comprehension and application. Clarity, precision and appropriateness of the items were considered while developing the test items.

Illustrative items for each objective are given below:

Knowledge

The knowledge level items measure the student's ability to recall or recognize information. This involves the recall of specifics and universals, the recall of methods and procedures or the recall of pattern, structure or setting.

Example: Who put forward the Law of Conservation of mass?

A. Lavoisier B. Newton C. Aristotle D. Plato

Comprehension

Comprehension involves largest general class of intellectual abilities and skills. It refers to a type of understanding or apprehension such that the individual knows what is being communicated and can make use of material or idea being communicated, relating it to other material or seeing its fullest implications.

Example: What is the ratio of masses of carbon and oxygen in carbon dioxide?

A. 3:8 B. 8:4 C. 8:3 D. 1:8

Application

Application is the use of an abstract idea in a particular and concrete situation and there by arriving at a solution of a problem. The abstraction may be in the form of general ideas, rules of procedures or generalized methods.

Example: What is the mass of neutron when the mass of proton is 1.00727u?

A. .00727 B. .00548 C. .00352 D. 1.00866

The investigator had written and pooled initially 80 items as per the pre-planned design. According to the suggestions of the supervising teacher and experts in the field, some items were rejected and some were modified. Hence the final form of the test was reduced to 60 items.

Out of the total 60 items the Knowledge level included 16 items, the Comprehension level included 24 items and Application level included 20 items.

Pilot testing.

For checking the clarity of instruction and suitability of the test, it was tried on a small sample of 30 students comprising of 15 boys and 15 girls of standard IX, in the M.S.P. school, Malappuram. Besides the written directions given in the test, oral instructions were also given to the students.

Pilot-test was also used for screening out discrepancies crept in the construction, assembling of test items, in the instruction given and also detecting the ambiguity of the distracters. After pilot- testing the test was again edited and the final test was prepared in a booklet form, along with the response sheet. The scoring key was also prepared. The Malayalam and English version of the draft test and its response sheet are given as Appendices VIII, IX and X respectively.

Item analysis

Achievement tests in chemistry treated for item analysis. Data and results of Item Analysis of Achievement Test in Chemistry for Standard IX are given in Table 9.

Table 9

Details of Item Analysis of Achievement Test in Chemistry for Standard IX

Sl. No.	U	L	DI	DP	Item Selected/ Rejected	Sl. No.	U	L	DI	DP	Item Selected/ Rejected
1	86	30	.58	.56	Selected	31	48	23	.35	.25	Rejected
2	94	35	.65	.59	Selected	32	83	26	.54	.57	Selected
3	82	21	.52	.61	Selected	33	30	15	.22	.15	Rejected
4	35	17	.26	.18	Rejected	34	48	23	.35	.25	Rejected
5	80	30	.55	.50	Selected	35	26	22	.24	.04	Rejected
6	47	23	.35	.24	Rejected	36	65	25	.45	.40	Selected
7	76	18	.47	.58	Selected	37	30	15	.22	.15	Rejected
8	72	30	.51	.42	Selected	38	69	31	.50	.38	Selected
9	65	30	.48	.35	Selected	39	53	18	.35	.35	Selected
10	50	33	.42	.17	Rejected	40	48	25	.36	.23	Rejected
11	73	17	.45	.56	Selected	41	88	34	.61	.54	Selected
12	58	23	.41	.35	Selected	42	67	32	.49	.35	Selected
13	54	17	.36	.37	Selected	43	35	24	.29	.11	Rejected
14	68	27	.48	.41	Selected	44	45	11	.28	.34	Selected
15	31	17	.24	.14	Rejected	45	35	13	.24	.22	Rejected
16	51	28	.39	.23	Rejected	46	48	25	.36	.23	Rejected
17	85	32	.58	.53	Selected	47	31	17	.24	.14	Rejected
18	87	21	.54	.66	Selected	48	59	23	.41	.36	Selected
19	83	23	.53	.60	Selected	49	68	36	.52	.32	Selected
20	95	33	.64	.62	Selected	50	74	11	.42	.63	Selected
21	35	13	.24	.22	Rejected	51	57	37	.47	.20	Rejected
22	93	45	.69	.48	Selected	52	48	19	.33	.29	Selected
23	74	24	.49	.50	Selected	53	53	17	.35	.36	Selected
24	85	26	.55	.59	Selected	54	74	14	.44	.60	Selected
25	42	22	.32	.20	Rejected	55	46	29	.37	.17	Rejected
26	31	17	.24	.14	Rejected	56	42	21	.31	.21	Rejected
27	90	35	.62	.55	Selected	57	33	23	.28	.10	Rejected
28	48	21	.34	.27	Selected	58	32	23	.27	.09	Rejected
29	49	29	.39	.20	Rejected	59	41	19	.30	.22	Rejected
30	60	21	.40	.39	Selected	60	49	29	.39	.20	Rejected

So, after item analysis, 34 items were selected for the final test.

Validity of the Achievement Test in Chemistry

Validity of the test is the accuracy with which the test measures what it intends to measure. The test was prepared based on the two chapters of IXth standard text book in Chemistry and hence the investigator claims content validity for the test.

Reliability of the Achievement Test in Chemistry

The reliability of the test was found out by Split half method. The correlation between scores on the odd and even numbered items of final test of 100 sample were scored separately. The correlation between scores on the odd-and even numbered items was calculated using Pearson's Product Moment Coefficient of Correlation method to find the reliability of the half-test. From this the reliability of the whole test was found out by Spearman Brown Prophecy formula.

The value of $r_{xx,}$ i.e., the full length correlation coefficient of the test was 0.81. This index suggests that the test was highly reliable to measure the achievement in chemistry of standard IX students.

Table 10

Weightage Obtained for the Content and Objectives in the Final Test of Achievement in Chemistry

Sl. No.	Content	No. of Items Under the Objectives			Total
		Knowledge	Comprehension	Application	
1.	Structure of Atom	5	8	5	18
2.	Chemical Bonding	4	6	6	16
	Total	9 (27%)	14 (41%)	11 (32%)	34

The number of test items selected for Chemistry after item analysis were 34. The standardized tool for testing Chemistry, its English version, response sheet and scoring key are given as Appendices XI, XII, XIII and XIV respectively.

3. Proficiency Test in English for Standard IX Students

The test was developed by the investigator with the help of supervising teacher. English Proficiency test is to test the spontaneous ability of a person to use English language for the real situations in everyday life. As the purpose of language in every day life is communication, the communication ability of the person is to be tested for evaluating the proficiency in English language. The language concerned is English and it is a foreign language as far as the students are concerned. Since the test is for IX Standard students and language is a subject based mainly on four skills listening, speaking, reading and writing, skills that are expected to achieve after successful completion of VIII Standard and whether those students have achieved that much proficiency in that language is to be evaluated.

For this a thorough perusal of the English text books up to Standard VIII and different items, models and patterns of question papers, national and international level, for testing language proficiency especially in English language was done. The assumption while preparing the tool was that a student, who can read and understand the question paper can answer it, might have already achieved the listening skill expected from a student of Standard IX. Finally the tool for testing proficiency in English was constructed with the help of supervising teacher and experts.

As it is a proficiency test in English language the test was intended to evaluate the application of both skills and knowledge of the language in real life situations, spontaneously. For testing reading comprehension two passages were given. Maximum care was taken to include passages probably unseen by the

students and to frame questions connected with real life situations. In order to test whether the student will be able to understand the creative, imaginative and figurative use of English language an unfamiliar poem was given. Ability to use Grammar and vocabulary etc within a context were also tested using cloze.

Construction of the test

In the test of Proficiency in English, it was decided to follow the English Proficiency Test Model developed by CBSE giving importance to Educational Objectives concerned with learning English language. For item construction three levels of objectives namely Knowledge and Perception, Understanding and Production, and Appreciation, were included in the test. Each category of objectives was defined and test items were prepared according to the different abilities specified under each category. The weightage assigned for various objectives is presented in Table 11.

Table 11

Weightage to Objectives in the Proficiency Test in English

Sl. No.	Objectives	Percentage	Marks
1.	Knowledge and Perception	30	15
2.	Understanding and Production	50	25
3.	Appreciation	20	10
	Total	100	50

The objectives selected can be verified only through the content. Hence the content of the question paper was selected accordingly. While choosing the content, Reading Comprehension, Vocabulary, Grammar etc were given due consideration.

Item writing

After fixing up the contents related to Proficiency in English to be included in the test the investigator started writing the specific items. Proper care was taken in wording the items to be as simple and direct as possible. The four distracters of each item framed were based on words or phrases studied and familiar to the students.

There was only one correct answer for each item. The students have to put a ('x') mark on the correct response in the response sheet which was additionally prepared and distributed. Personal details such as the name of the school, gender and locale of school were also asked to write in the response sheet.

For the present study, items were prepared giving due consideration to Reading Comprehension, Vocabulary, Grammar which in turn will realize objectives specified. Clarity, precision and appropriateness of the items were considered while developing the test items.

(A bookseller wanted to sell 14 historical novels among middle school and high school students and teachers through internet. In the introduction the seller gives the reason for his interest in historical fiction. He did not give the review of the books instead he requested the browser to click the given button for getting the full review. The questions to test the levels of objective framed through reading comprehension is as follows)

Illustrative items of each objective are given below:

(Questions 6-10) Read the following passage carefully and answer the questions given below.

"*Historical fiction is my favorite genre, and within that, World War II and the Holocaust are my favorite historical events to read about. It is likely because those are the events that shaped my grandparents' generation and I had a close relationship with my grandparents. It's also a time in history of fascinating extremes, a time when people demonstrated amazing courage and selflessness, but also a time when people were consumed by terrible cruelty and evil.*

Here's 14 historical fiction titles, focused on World War II and/or the Holocaust and separated into middle school and high school, that I've recently read and would recommend. Click the title of each to read my full review and ideas for using it in the classroom."

Knowledge and Perception

The knowledge and perception level items measure the student's ability to perceive, recall or recognize information. This involves the recall of specifics and universals, the recall of methods ideas and procedures or the recall of pattern, structure or usage.

Example: How many books does the author suggest for schools?

a. Fourteen b. Two c. Twenty-eight d. Eight

Understanding and Production

Understanding and Production involves largest general class of intellectual abilities and skills. It refers to a type of understanding or apprehension such that the individual knows what is being communicated and can make use of material or idea being communicated, relating it to other aspects.

Example: What will we do to get author's full review?

a. Click b. Read c. Write d. Use

Appreciation

Appreciation involves respect and admiration towards great writers, social values and appreciation of sensuousness, system, rhythm etc noticed in English literature.

Example: What was common in peoples' character during Holocaust ?

a. Sympathy b. Cruelty c. Empathy d. Kindness

The investigator had written and pooled initially 60 items as per the pre-planned design. According to the suggestions of the supervising teacher and experts in the field, some items were rejected and some were modified. Hence the final number of the items of the test was reduced to 50.

Out of the total 50 items the Knowledge and perception level includes 15 items, the Understanding and Production level includes 25 items, Appreciation level includes 10 items.

Pilot testing

In order to check the clarity of instruction and suitability of the test, it was tried on a small sample of 30 students comprising of 15 boys and 15 girls of standard IX, of M.S.P. school, Malappuram. Besides the written directions in the test, oral instructions were also given to the students.

Pilot-test was also used for screening out discrepancies crept in the construction, assembling of test items, in the instruction given, and also detecting the ambiguity of the distracters. After pilot-testing the test was again edited and

the final test was prepared in a booklet form, along with separate response sheet. The scoring key was also prepared. The draft test and response sheet are given as Appendices XV and XVI respectively.

Proficiency test in English-Item Analysis

The 100 response sheets of Proficiency test in English in the upper group and 100 response sheets of the lower group were selected for item analysis. On the basis of total score obtained, the answer sheets were arranged in descending order. From this arranged sheets two such groups were separated as upper group consisting of 27% of those who got highest scores on the test and lower group of 27% who received lowest scores i.e. 100 in each group.

The difficulty index and discriminating power were calculated using the following formula.

$$\text{Difficulty Index} = \frac{U + L}{2N}$$

$$\text{Discriminating power} = \frac{U - L}{N}$$

Where,

U = Number of correct responses in the upper group

L = Number of correct responses in the lower group

N = Number of score sheets in the upper or lower group

Data and results of Item Analysis are given in Table 12.

Table 12

Details of Item Analysis of Proficiency Test in English for Standard IX

Sl. No.	U	L	DI	DP	Item Selected/ Rejected	Sl. No.	U	L	DI	DP	Item Selected/ Rejected
1	87	38	.63	.49	Selected	26	43	19	.31	.24	Rejected
2	72	22	.47	.5	Selected	27	19	25	.22	.06	Rejected
3	78	18	.48	.6	Selected	28	36	24	.3	.12	Rejected
4	93	33	.63	.6	Selected	29	36	23	.3	.13	Rejected
5	95	47	.71	.48	Selected	30	43	19	.31	.24	Rejected
6	94	45	.7	.49	Selected	31	60	29	.45	.31	Selected
7	71	22	.47	.49	Selected	32	73	27	.5	.46	Selected
8	19	25	.22	.06	Rejected	33	28	24	.26	.04	Rejected
9	71	20	.46	.51	Selected	34	76	17	.47	.59	Selected
10	90	32	.61	.58	Selected	35	47	16	.32	.31	Selected
11	36	24	.3	.12	Rejected	36	78	26	.52	.52	Selected
12	43	19	.31	.24	Rejected	37	32	15	.24	.17	Rejected
13	64	20	.42	.44	Selected	38	56	27	.42	.3	Selected
14	44	18	.31	.26	Selected	39	16	24	.2	.08	Rejected
15	71	24	.48	.47	Selected	40	36	23	.3	.13	Rejected
16	58	24	.41	.34	Selected	41	53	20	.37	.33	Selected
17	48	21	.35	.3	Selected	42	64	13	.37	.51	Selected
18	87	27	.57	.6	Selected	43	62	29	.46	.33	Selected
19	57	18	.38	.39	Selected	44	63	21	.42	.42	Selected
20	43	19	.31	.24	Rejected	45	47	10	.29	.37	Selected
21	21	9	.15	.12	Rejected	46	43	19	.31	.24	Rejected
22	90	32	.61	.58	Selected	47	32	15	.24	.17	Rejected
23	30	16	.23	.14	Rejected	48	57	26	.42	.31	Selected
24	90	37	.64	.53	Selected	49	45	12	.29	.33	Selected
25	43	19	.31	.24	Rejected	50	48	18	.33	. 3	Selected

Validity of Proficiency test in English

Validity of the test is the accuracy with which the test measures what it intends to measure. As the test was constructed following the guidelines of the CBSE model Proficiency Test in English for High School classes which was conforming to the content of English text books for High School but general in nature, the validity of the test was determined by correlating the test scores with the marks obtained by the students in their school examination as an external criterion. The marks obtained by students in English for the first terminal examination for a sample of 100 were taken. Then the coefficient of validity was calculated using the Pearson's Product Moment Coefficient of Correlation method (Garret, 1979). It was found to be 0.835 which means that the test has high validity.

Reliability of the Proficiency Test in English

The reliability of the Test of Proficiency in English was determined by test retest method. Internal consistency was estimated by calculating alpha, Cronbach's Coefficient. The formula used was

$$r_{kk} = K/K\text{-}1[\ 1\text{-}\frac{\Sigma S_1^{\ 2}}{S_x^{\ 2}}\ ] \qquad \text{(Brown, 1976)}$$

Where K = The number of items in the test

S_1^2 = Sum of the variance of the item scores

Sx^{2} = The variance of the test scores of all 'K' items.

The retest was conducted after 4 weeks from the first administration of the test. The retest was administered to 20 boys and 20 girls of M.S.P.H.S.S.,

Malappuram. The results of the estimation of reliability using test-retest method and by using Cronbach's Coefficient alpha shows that the Test of Proficiency in English is highly reliable and the results are as follows.

N= 20 + 20=40, R= 0.81

N=370, alpha= 0.83

The number of test items selected for Proficiency in English after item analysis was 32. The standardized tool for testing Proficiency in English, response sheet and scoring key are given as Appendix XVII, XVIII and XIX respectively.

Table 13

Weightage Obtained for the Objectives in the Final Test of Proficiency in English

Sl. No.	Objectives	Percentage*	Marks
1	Knowledge and Perception	29	9
2	Understanding and Production	50	16
3	Appreciation	22	7

*Approximate percentage

4. Socio-Economic Status Scale

The data of Socio-Economic Status of the family was collected by using Socio-Economic Status Scale developed by Gopalakrishnan and Naseema (2018). The tool was used to measure the demographical details of the students such as gender, caste, age, religion, family size, parental education, parental occupation, parental income etc.

The Socio-Economic Status Scale consists of two sections.

Section I was for the collection of the data related to the student, the name of school and place of school.

Section II was for writing the details of the parents or guardian like education, occupation, income, condition of health etc.

Mode of answering

Students are asked to mark their responses in the space given on the Socio-Economic Status Scale by putting a (X) mark.

Scoring

The scoring key of the Socio-Economic Status Scale is given below:

Parental education

The educational level of parents was divided into 7 categories and each category was awarded certain points as given in Table 14.

Table 14

Scoring Procedure of Parental Education

Sl. No.	Educational Level of Parents	Points Awarded
1	Illiterate	0
2	Primary Education	2
3	High school/Higher Secondary/ITI/TTC, Diploma etc	4
4	Any Degree	6
5	Any Post Graduation	8
6	Engineering or Medical Degree	10
7	Post Graduation in Engineering or Medicine or Ph.D.	20

Parental occupation

Starting from Unemployed to Highly Professional, Parental Occupation is classified into 6 categories and are awarded different points and the details are presented in Table 15.

Table 15

Scoring Procedure of Parental Occupation

Sl No	Parental Occupation	Points Awarded
1	Unemployed	0
2	Unskilled	1
3	Farmer below 50 cent land ownership/ Individual business	2
4	Farmer below 2 Acres land ownership/ Business with less than 10 employees	4
5	Semi Professional /Farmer below 15 Acres land ownership/ Business with 10 to 20 employees	8
6	Highly Professional / Farmer above 15 Acres land ownership/ High Level business	10
7	Parent is suffering from serious illness such as cancer, heart disease, kidney problem etc.	-2

Parental income

The lowest Parental monthly income was fixed as Rs 5000 and the highest was above Rs 100000 and the points allotted are given in Table 16.

Table 16

Scoring Procedure of Parental Income

Sl. No.	Parental Income	Points Awarded
1	Below 5000	1
2	5001-10000	4
3	10001-30000	6
4	30001-50000	8
5	50001-100000	10
6	Above 100000	20

Socio-Economic Status Scale is presented as Appendix XX.

Pilot testing

In order to check the clarity of instruction and suitability of the scale, Pilot-test was conducted for screening out discrepancies crept in the construction, assembling of items, in the instruction given, and also for detecting the ambiguity of the items given. Pilot test was administrated to a randomly selected students, comprising of 15 boys and 15 girls of standard IX, in the M.S.P. school, Malappuram. Besides the written directions, oral instructions were also given to the students. The students were asked to mark their responses in the space, against the questions, provided in the data sheet itself.

After pilot- testing the data sheet was again edited and the final data sheet was prepared and it is given as Appendix XX.

Sum of the scores on Parental Education, Parental Occupation and Parental Income was considered as score on Socio-Economic Status.

Validity and Reliability of Socio-Economic Status Scale

Whatever may be the test whether it is concerned with quantitative data or qualitative data the validity of the test is the accuracy with which the test measures what it intends to measure. According to Garrett the test validity depends upon the fidelity with which the test measures what it intends to measure. As far as Socio-Economic Status Scale is concerned with qualitative data the validity is depending upon honesty, depth richness, and scope of the data collected. The degree of accuracy and comprehensiveness of coverage makes the test reliable.

With the help of supervising teacher and seeking help from other experts and reviewing related literature the scale to measure Socio-Economic Status had achieved adequate coverage of the whole related aspects. Hence the individual items of the Socio-Economic Status Scale in totality would give a real idea of the Socio-Economic Status of the students. So the scale has face validity. Triangulation was used as a method for ensuring the reliability of the data obtained using Socio-Economic Status Scale and the general data obtained from other tools and data obtained after verification of school records. The investigator found that the data obtained from different sources mentioned were in good agreement and supporting the reliability of the scale.

5. Questionnaire on Parental Support

The other contextual variable was Parental Support. As most of the time children are at home, there is no doubt that the behavior of the parents will influence their children. Home environment and the attitude of parents will affect Children's achievement in school subjects. Parents involvement in their children's academic activities vary considerably from parent to parent because of parent's education, occupation, attitude etc. Though these were the general

assumptions it was not sure that the achievement of Students in Physical Science had any relation to their parental support in their studies.

Review of related literature and information got from experts, teachers and supervising teacher helped the investigator to identify different dimensions of parental related factors that would support the students in their studies. Parental Aspiration, Parental Attention, Parental Encouragement, Parental Guidance, Parental Influence, Parental Care, Parental Acceptance and Parental Interest were the main components of Parental Support identified. The investigator prepared a Questionnaire with the help of Supervising Teacher for the collection of data concerned with the variable Parental Support. Proper care was taken to include maximum questions regarding all the above mentioned areas related with Parental Support. There were 40 questions in the Questionnaire. Consulting with experts and supervising teacher the eight questions were omitted and finally 32 questions were selected for the test. All the questions were closed items to which the students had to answer 'Yes' or 'No' or 'Don't Know'. Typical Items in the Questionnaire concerned with different areas related to parental support are given below.

1. Parental Guidance

Do your Parents take time and effort to teach you the difficult portion in physical science?

Yes No Don't Know

2. Parental Attention

Do your parents give regular attention in your physical science learning?

Yes No Don't Know

3. Parental Encouragement

Do your Parents make you aware of the recent developments in physical science?

Yes No Don't Know

4. Parental Influence

Whether your parents give much importance in your physical science learning?

Yes No Don't Know

5. Parental Aspiration

Whether your parents wish that you will get good job through your physical science learning?

Yes No Don't Know

6. Parental Care

Do your parents consciously avoid entertainment programmes in T.V. while you study?

Yes No Don't Know

7. Parental Acceptance

Do your parents watch patiently when you do experiments related to physical science at home?

Yes No Don't Know

8. Parental Interest

Are your parents very much interested in your physical science achievements?

Yes No Don't Know

Mode of answering

Students are asked to mark their responses in the space given on the Questionnaire by putting a ('x') mark.

Scoring

The scoring key of the Questionnaire on Parental Support was as follows:

There were 3 answers for each question and the students were requested to select the suitable one and mark on the separate answer sheet provided. For choice 'Yes' the score given was 2. For 'Don't Know' the score was 1 and for the answer 'No' the score was 0.

Pilot testing

To have an estimate of time and to check whether there was any ambiguity in the item, the questionnaire was administrated to a group of students randomly selected, comprising of 20 boys and 20 girls of standard IX, in the M.S.P. school, Malappuram. Besides the written directions given in the, oral instructions were also given to the students. They were provided with separate response sheets. Time taken for the completion of the questionnaire was noted by the investigator. After pilot- testing the questionnaire was again edited and the final questionnaire was prepared with the separate response sheet. A copy of the questionnaire, its translated version and its response sheet are given as Appendices XXI, XXII and XXIII respectively.

Validity and Reliability of Questionnaire on Parental Support

Thorough perusal of the related literature and consultation with experts and supervising teacher helped the investigator to develop a questionnaire that covers

all the important areas of Parental Support that parents can give their children in their studies especially Physical Science. As the totality of the questions asked encompassed all those areas such as parental influence, parental attention, parental guidance etc. The Questionnaire has content validity and face validity.

The reliability of the Questionnaire on Parental Support was determined by test- retest method. Internal consistency was estimated by calculating Cronbach's alpha Coefficient. The formula used was

$$r_{kk} = K/K\text{-}1[\ 1-\frac{\Sigma S_1^{\ 2}}{S_x^{\ 2}}\ ] \qquad \text{(Brown, 1976)}$$

Where K = The number of items in the test

S_1^2 = Sum of the variance of the item scores

Sx^2 = The variance of the test scores of all 'K' items. (Brown, 1976)

The retest was conducted after 4 weeks from the first administration of the test. The retest was administered to 20 boys and 20 girls of M.S.P.H.S.S., Malappuram. The results of the estimation of reliability using test-retest method and by using Cronbach's Coefficient alpha showed that, the Questionnaire on Parental Support is highly reliable and the results are as follows:

N= 40, r = 0.86 (test-retest)

N=370, Cronbach's alpha Coefficient = 0.852.

Sample Intended for the Study

The selection of the sample is one of the most important aspects of research study. The primary purpose of research is to discover principles that have universal application. But to study a whole population and to arrive at

generalizations would be impracticable. The process of sampling makes it possible to draw valid inferences or generalizations on the basis of careful observation of variables with a relatively small proportion of population.

In the present study it was proposed to take a sample of 1200 students studying in standard IX, randomly from the schools situated in the Revenue Districts of Kannur, Kozhikode, Malappuram, Palakkad, Thrissur, Ernakulam, Kottayam, Alappuzha, Kollam and Thiruvananthapuram in Kerala. Even though the size of the population was finite because of its huge size, it was impossible and impractical to study the population characteristics as such. Therefore it was decided to take representative sample of the population in which representative determines the extent of generalization of the result through this study. Treating this as the reference population, the investigator selected the sample to cover all the relevant strata such as boys and girls, students of urban and rural, government and private schools.

Table 17

Distribution of the Initial Sample

Sub sample	No of students	Total
Boys	600	1200
Girls	600	
Urban school students	600	
Rural school students	600	
Government school students	420	
Private school students	780	

Distribution of Intended Sample

Boys → 600

Girls → 600

Total → 1200 in which 300 boys from rural schools and 300 boys from urban schools, 300 girls from rural schools and 300 girls from urban schools, and in which 240 boys from government schools and 360 boys from private schools and 240 girls from government schools and 360 girls from private schools were selected.

Data Collection

The administration of the tools was done in the first week of July 2018. After fixing the sample the investigator contacted the heads of the schools, informed about the need of the present study, and received permission to administer the tests. Proper instructions were given to the students before starting the test. The time schedule was fixed earlier. Proper instructions were given before starting the tests. The tests were administered with the assistance of teachers in the concerned class. Each student was given the printed question booklets and printed response sheets of the each of the four tests one after the other as soon as the completion each one of the four tests. After that the data sheet of Socio-Economic Status Scale was administered. The response sheets were scored after rejecting incomplete sheets. Only 384 response sheets were selected from each category for analysis of which 14 response sheets were discarded randomly and 370 response sheets from each category were selected and scored.

The Administration of the tools was completed in the second week of November 2018.

As Socio-Economic Scale and Questionnaire on Parental Support needed thorough attention and clarification, from the five tools to be distributed the former was supplied first. After collecting the completed data sheets from all the students the latter was supplied. Proper instruction was given to each student. After collecting the response sheet of Questionnaire on Parental Support the Proficiency test in English and then Achievement test in chemistry were administered since the Achievement Test in Physics contained some problems to solve and for mathematically weak students it might be time consuming. So before administering Achievement test in Physics, Achievement test in chemistry was administered. In all the instances at first the response sheets were supplied to each student with proper instructions to fill it. Then the question booklets were distributed. General instruction given in the question booklets were read out to the students to familiarize them with the tools.

Scoring and Consolidation of Data

Response sheets of two Achievement tests and Proficiency test in English were scored as per the scoring scheme of the test. Punched scoring keys were used for scoring. To each correct response 'one' score was given and a 'zero' score was given to the wrong answer. The total score of Achievement test in Physics, total score of Achievement test in Chemistry and total score of test for Proficiency in English were equal to the number of correct answer in each paper. The responses of Socio-Economic Status Scale and the response sheet of

Questionnaire on Parental Support were valued giving respective points to each response as stated earlier.

Final Sample Obtained for the Study

Though the test was administered to 1200 students, response sheets of 182 students were rejected since their score sheets were incomplete. From the remaining 1018 score sheets of each test 1000 were selected as the final sample by random rejection of answer sheets so as to get a proportional subsample, based on gender, locale and type of management of the school.

Break up of the Final Sample

Boys	500	Rural	500	Government	400
Girls	500	Urban	500	Private	600
Total	1000	Total	1000	Total	1000

Details of the school wise distribution of the final sample are given in Table 18.

Table 18

Details of School-wise Distribution of the Final Sample

Sl. No.	Name of School	Gender		Total	Locality		Type		Total
		M	F		R	U	Gov	Priv	
1	TRKHSS Vaniyamkulam	35	25	60	60	--	--	60	60
2	GMMGHSS Palakkad	--	95	95	--	95	95	--	95
3	PMGHSS Palakkad	26	7	33	--	33	33	--	33
4	HSS Chethavoor	21	17	38	38		--	38	38
5.	VBHSS Trichur	35	--	35	--	35	--	35	35
6.	KHSS Moothanthara	23	17	40		40		40	40
7.	G..H.S.S. Vellamanal	16	15	31	31		31		31
8.	St.Johns HSS Eravipuram	13	13	26		26		26	26
9.	GMBHSS Thiruvanathapuram	83	--	83	--	83	83	--	83
10.	MSPHSS Malappuram	28	18	46		46	--	46	46
11.	CMHSS Mannur	15	17	32	32	--	--	32	32
12	GVHSS Feroke	10	10	20		20	20		20
13	FHSS Farookcollege	23	17	40	40	--	--	40	40
14	VGHSS Trichur	--	15	15	--	15		15	15
15	GHSS Cheruthuruthy	19	20	39	39	--	39	--	39
16	GBHSS Thalaserry	24	11	35	--	35	35	--	35
17	AMHSS Thirurkkad	17	16	33	--	33	--	33	33
18	PRMHSS Panoor	11	28	39	--	39	--	39	39
19	GBHSS Makkaraparamba	19	8	27	27	--	27	--	27
20	SNDPHSS Aluva	15	18	33	33	--	--	33	33
21	GHSS Kuttmassery	28	15	43	43	--	43	--	43
22	GGHSS Mavelikkara	--	94	94	94	--	94	--	94
23	BHSS Mavelikkara	17	20	37	37	--	--	37	37
24	MTSeminari HSS Kottayam	22	4	26	26	--	--	26	26
Total		500	500	1000	500	500	500	500	1000
Total					1000		1000		1000

The scores in the tests of Achievement in Physics, Achievement in Chemistry, Proficiency test in English and the Points obtained in Socio-Economic Scale and Questionnaire on Parental Support were tabulated for further analysis. The consolidation was done by keeping in view the important subsamples to be obtained almost proportional viz; the gender groups (Boys and Girls), Locality (Urban and Rural) Type of Management (Government and Private).

Statistical Techniques Used for Analysis

The main statistical techniques employed for the present investigation are given below.

Preliminary Analysis

The Mean, Median, Mode, Standard Deviation, Skewness and Kurtosis were calculated for the independent variables, Proficiency in English, Socio-Economic Status and Parental Support and for the dependent variables Achievement in Physics and Achievement in Chemistry (Achievement in Physical Science) for total sample and subsamples using conventional methods.

Two-tailed Test of Significance of Difference between Means of Large Independent Samples (Best & Kahn, 1986)

In this the difference between means of the Achievement in Physics and Achievement in Chemistry (dependent variable) and scores on independent variables Proficiency in English, Socio-Economic Status and Parental Support of boys and girls, Rural and Urban and Government and Private school students were calculated.

The critical ratio, indicating the difference between means was determined by the formula,

$$C.R = \frac{M_1 - M_2}{\sqrt{\frac{\sigma_1^{\,2}}{N_1} + \frac{\sigma_2^{\,2}}{N_2}}}$$

Where,

M_1 and M_2 are the means of the groups

σ_1 and σ_2 are the standard deviations of the groups

N_1 and N_2 are the sample size of the groups

If the 't' value obtained $\geq \pm 2.58$, the difference between means was considered to be significant at 0.01 level. If the 't' value obtained was $\geq \pm 1.96$, it was considered to be significant at 0.05 level.

Pearson's Product Moment Coefficient of Correlation 'r' (Best & Kahn, 1992)

In order to estimate the extend of relationship between the dependent variable, Achievement in Physics and Achievement in Chemistry and independent variables Proficiency in English, Socio-Economic Status and Parental Support the technique of Pearson's Product Moment Coefficient of Correlation was used. The machine formula used to calculate 'r' is

$$r = \frac{N\sum XY - \sum X \sum Y}{\sqrt{\left[N\sum X^2 - \left(\sum X\right)^2\right]\left[N\sum Y^2 - \left(\sum Y\right)^2\right]}}$$

Where

X and Y are two variables

$\sum XY$ = Sum of the products of all the paired X and Y values of the data

$\sum X^2$ = Sum of the squares of all the X scores

$\sum Y^2$ = Sum of the squares of all the Y scores

$\sum X$ = Sum of all the X scores

$\sum Y$ = Sum of all the Y scores

N = Size of the sample

r = Coefficient of Correlation

Verbal Interpretation of 'r' (Garrett, 1979)

The coefficient of correlation between two variables is described as 'substantial', 'high', 'low' or 'negligible', depending upon the numerical index 'r'

In Psychological and educational testing, the following criteria are used for verbal interpretation of the degree of relationship between the variables. (Garrett, 1979)

r from ± 0.00 to ± 0. 20- Denotes negligible relationship

r from± 0.20 to ± 0. 40 - Denotes low relationship

r from ±0.40 to ± 0. 70 - Denotes substantial relationship or marked relationship

r from ±0.70 to ±1.00 - Denotes high relationship

Test of Significance of 'r' (Ferguson, 1976)

The obtained 'r' was tested to find whether it is significant or not by using Fisher's t test viz.,

$$t = r\sqrt{\frac{N-2}{1-r^2}}$$

Where, N-2 is the degrees of freedom; 'r', the obtained coefficient of correlation and N, the size of the sample for which r was computed.

0.99 Confidence Interval ($CI_{0.99}$) of r (Garrett, 1979)

The confidence interval of 'r' was worked out using the formula suggested by Garrett (1979)

$(r \pm 2.58\ SE_r)$

Where, $SE_r = \frac{1 - r^2}{\sqrt{N - 1}}$

SE_r = Standard error of 'r'

r = the obtained coefficient correlation

N = size of the sample

If the 'r' value obtained is significant only at 0.05 level or not significant the 0.95 confidence interval of 'r' is estimated using the formula ($r \pm 1.96\ SE_r$). In the case of very low correlation the 'r' values are converted into Fisher's Z function and find the standard error of Z.

$$(\text{SE of Z}) = \frac{1}{\sqrt{N - 3}}$$

Shared variance

The square of the r expressed as a percentage (r^2 x 100) gives the idea of the percentage variance that is common for two variables correlated (Fox, 1969). This was worked out in order to be of help in interpreting the r's.

Test of Significance of difference between two 'r's (Garrett, 1979)

The test of Significance of Difference between correlations was done by the two-tailed test for the difference between r's of large independent samples by the formula

$$\text{C.R.} = \frac{Z_1 - Z_2}{\sqrt{\frac{1}{N_1 - 3} + \frac{1}{N_2 - 3}}}$$

Where,

Z_1 = Fisher's Z corresponding to r_1

Z_2 = Fisher's Z corresponding r_2

N_1 = Size of the sample 1

N_2 = Size of the sample 2

Critical ratios can be interpreted using the two tailed test of significance.

Multiple Correlation

As there were three independent variable and two dependent variables, the correlation found out using two variables at a time, the estimation of correlation might be mistaken and assessment and interpretation misleading. This problem can be solved by computing the Multiple Correlation. Multiple Correlation estimates the combined effect of variables on the criterion variable under study. The square of the Multiple Correlation Coefficient or the coefficient of determination R^2 was computed using the formula $R_1^2{}_{(23\ldots n)} = ß_{12.34\ldots..n}r_{12+} ß_{13.24\ldots..n}r_{13+} ß_{14.23\ldots..n}r_{14} +\ldots\ldots+ ß_{1n.23\ldots.. (n-1)}\, r_{1n}$ (Multiple R^2 in terms of ß coefficients and zero order r's)

Where 1 stands for the criterion variable and 2,3…n for the predictor variable.

$R_1^2{}_{(23\ldots n)}$ gives the proportion of the variance of the criterion measure (X_1) attributable to the joint action of the predictor variables X_2, X_3,…….X_n

Significance of R

Standard error of multiple R, $SE_R = \dfrac{\left(1-R^2\right)}{\left(\sqrt{N-m}\right)}$ where

m= number of variable being correlated

N= size of the sample

(N-m) = degrees of freedom.

ANALYSIS

- Objectives of the Study
- Hypotheses of the Study
- Preliminary Analysis
- Test of Significance of Difference between Mean Scores
- Correlation Analysis
- Comparison of Correlations
- Multiple Regression Analysis

ANALYSIS

The data collected was analyzed statistically with reference to the objectives framed for the study. The details of the statistical analysis and interpretation of the results are presented in this chapter. The analysis of the data enabled to realize the specific objectives kept for the study.

Analysis mainly consists of one to five sections namely Preliminary Analysis, Test of significance of difference between means, Pearson's Product moment Co-efficient of Correlation, Comparison of Correlations and Multiple Regression.

In the Preliminary Analysis part, the important statistical constants such as mean, median, mode, standard deviation, skewness and kurtosis of the scores of the tests of each variable for total sample and subsamples were calculated and the scores obtained were tested for normality by plotting graphs. In the second section the test of significance of difference between means as described by Garrett (1976) was done to find out whether there exist any significant difference in the mean scores of Achievement test in Physics, Achievement test in Chemistry, Proficiency in English and the Selected Contextual Factors (Socio Economic Status and Parental Support) between the subsamples boys and girls, students of the urban and rural schools and students of the government and private schools.

The third section deals with the linear correlation between the variables of the study for total sample and relevant subsamples. The level of significance of all the obtained correlation coefficients were later tested against null

hypothesis. The percentage overlaps and confidence intervals of all the obtained correlations were found to enable necessary interpretations. The correlations obtained for subsamples were compared in the fourth section using the formula for critical ratio by Garrett (1979). In the fifth section the multiple regression equations, for predicting the scores of the dependent variables Achievement in Physics, Achievement in Chemistry from the scores obtained for the tests of the three independent variables, were found out. In order to assess the maximum correlation between the earned scores and predicted scores the co-efficient of multiple correlation were also worked out in this part. All the statistical analysis of the data were conforming to the objectives of the study.

Objectives of the Study

The objectives of the present study are as follows:

1. To find out the mean scores of the Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) and Proficiency in English and the selected Contextual Factors (Socio-Economic Status and Parental Support) for total sample and the selected subsamples such as gender of students, locality and management category of schools.
2. To find out whether there exists any significant difference in the mean scores of the Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) and Proficiency in English and the selected Contextual Factors (Socio-Economic Status and Parental Support) for the selected subsamples such as gender of students, locality and management category of schools.

3. To estimate the extent of relationship among Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) and Proficiency in English and the selected Contextual Factors (Socio-Economic Status and Parental Support) for total sample and the selected subsamples such as gender of students, locality and management category of schools.

4. To compare the relationship among Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) and Proficiency in English and the selected Contextual Factors (Socio-Economic Status and Parental Support) for the selected sub samples such as gender of students, locality and management category of schools.

5. To find out whether Achievement in Physical Science can be predicted from Proficiency in English and selected Contextual Factors (Socio economic Status and Parental Support) for the total sample.

Hypotheses of the Study

1. The mean scores of the Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) and Proficiency in English and the selected Contextual Factors (Socio-Economic Status and Parental Support) for total sample and the selected subsamples such as gender of students, locality and management category of schools will be different.

2. There will be significant difference in the mean scores of the Achievement in Physical Science (Achievement in Physics and

Achievement in Chemistry) and Proficiency in English and the selected Contextual Factors (Socio-Economic Status and Parental Support) for the selected subsamples such as gender of students, locality and management category of schools

3. There will be significant relationship among Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) and Proficiency in English and the selected Contextual Factors (Socio-Economic Status and Parental Support) for total sample and the selected subsamples such as gender of students, locality and management category of schools
4. There will be significant difference in the relationship among Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) and Proficiency in English and the selected Contextual Factors (Socio-Economic Status and Parental Support) for the selected subsamples such as gender of students, locality and management category of schools.
5. Achievement in Physical Science can be predicted from Proficiency in English and selected Contextual Factors (Socio economic Status and Parental Support) for the total sample.

Preliminary Analysis

The data for the present study has been collected with the help of five tools for Achievement in Physical Science (Achievement in Physics and

Achievement in chemistry), Proficiency in English, Socio Economic Status and Parental Support. The scores on the above tests yielded the required data from the final sample (N= 1000) and they were subjected to statistical treatment.

As a first step of analysis, the important statistical constants such as mean, median, mode, standard deviation, skewness, and kurtosis of the variables namely Proficiency in English, Socio Economic Status and Parental Support (independent variables) and Achievement in Physical Science (Achievement in Physics and Achievement in chemistry- dependent variables) were determined. The summary of the statistical constants are presented in Table 19.

Table 19

Statistical Constants of Achievement in Physics and Achievement in Chemistry, Proficiency in English, Socio Economic Status and Parental Support for the Total Sample and the Subsamples

Statistical Constants	Achievement in Physics	Achievement in Chemistry	Proficiency in English	Socio Economic Status	Parental Support
18-a. Statistics for Total Sample					
N	1000	1000	1000	1000	1000
Mean	54.00	50.57	48.29	17.85	23.34
Median	53.00	47.00	47.00	16.00	24.00
Mode	65	41	53	14	25
Std. Deviation	18.90	17.97	17.28	5.69	4.26
Skewness	.190	.358	.283	1.453	-.355
Kurtosis	-.886	-.675	-.562	2.780	-.477

Statistical Constants	Achievement in Physics	Achievement in Chemistry	Proficiency in English	Socio Economic Status	Parental Support
18-b_1. Statistics for Boys					
N	500	500	500	500	500
Mean	49.50	46.30	44.77	17.57	22.75
Median	45.00	44.00	42.00	16.00	23.00
Mode	35	41	53	14	20
Std. Deviation	18.73	17.54	17.06	5.48	4.31
Skewness	.419	.538	.437	1.508	-.199
Kurtosis	-.696	-.419	-.520	3.113	-.676
18- b_2. Statistics for Girls					
N	500	500	500	500	500
Mean	58.49	54.84	51.82	18.13	23.94
Median	59.00	53.00	50.00	16.00	24.50
Mode	65	38	50	14	25
Std. Deviation	17.99	17.40	16.79	5.87	4.13
Skewness	.032	.253	.181	1.398	-.518
Kurtosis	-.895	-.797	-.462	2.506	-.113
18-c_1. Statistics for students in Urban Schools					
N	500	500	500	500	500
Mean	53.87	51.26	48.69	18.30	23.41
Median	53.00	50.00	48.00	18.00	24.00
Mode	53	41	53	14	25
Std. Deviation	18.97	18.32	16.69	5.90	4.35
Skewness	.213	.299	.207	1.418	-.312
Kurtosis	-.923	-.755	-.462	2.750	-.527
Table 8-c_2. Statistics for students in Rural Schools					
N	500	500	500	500	500
Mean	54.12	49.89	47.90	17.40	23.28
Median	53.00	47.00	47.00	16.00	24.00

Statistical Constants	Achievement in Physics	Achievement in Chemistry	Proficiency in English	Socio Economic Status	Parental Support
Mode	65	38	42	14	25
Std. Deviation	18.84	17.62	17.86	5.44	4.17
Skewness	.167	.417	.355	1.481	-.410
Kurtosis	-.844	-.576	-.636	2.755	-.422
18-d_1. Statistics for students in Government Schools					
N	400	400	400	400	400
Mean	55.27	51.44	50.97	18.29	23.15
Median	55.00	50.00	50.00	18.00	23.00
Mode	65	44	50	14	25
Std. Deviation	17.55	17.33	17.02	5.60	3.99
Skewness	.127	.348	.182	1.483	-.340
Kurtosis	-.756	-.580	-.596	3.157	-.498
18-d_2. Statistics for students in Private Schools					
N	600	600	600	600	600
Mean	52.73	49.71	45.61	17.41	23.54
Median	50.00	47.00	44.00	16.00	24.00
Mode	35	41	42	14	25
Std. Deviation	20.09	18.57	17.14	5.74	4.50
Skewness	.278	.387	.411	1.464	-.394
Kurtosis	-.983	-.748	-.428	2.560	-.492

Table 19 shows that the statistical constants such as mean, median, mode, standard deviation, skewness and kurtosis of the Achievement in Physics for total sample are 54.0, 53.0, 65, 18.90, 0.19 and -0.89 respectively, Achievement in Chemistry are 50.57, 47.00, 41, 17.97, 0.36 and -0.68 respectively. Similarly the statistical constants such as mean, median, mode, standard deviation, skewness and kurtosis of the Proficiency in English are 48.29, 47.00, 53, 17.28, 0.28 and -

0.56 respectively, Socio Economic Status Score are 17.85, 16.00, 14, 5.69, 1.45 and 2.78 respectively and score on Parental Support are 23.34, 24, 25, 4.26, -0.36 and -0.48 respectively. All values have been calculated for the total sample (N=1000).

The shape of the distribution of scores of Achievement in Physics, Achievement in Chemistry, Proficiency in English, Socio Economic Status and score on Parental Support for the total sample were examined by plotting the distribution. The smoothed frequency curve of the variables are presented in Figure 1, Figure 2, Figure 3, Figure 4 and Figure 5 respectively. The statistical constants and the graphical representation of the variables revealed that all distributions are approximate to normality.

Figure 1

Smoothed Frequency Curve for Achievement in Physics for Total Sample

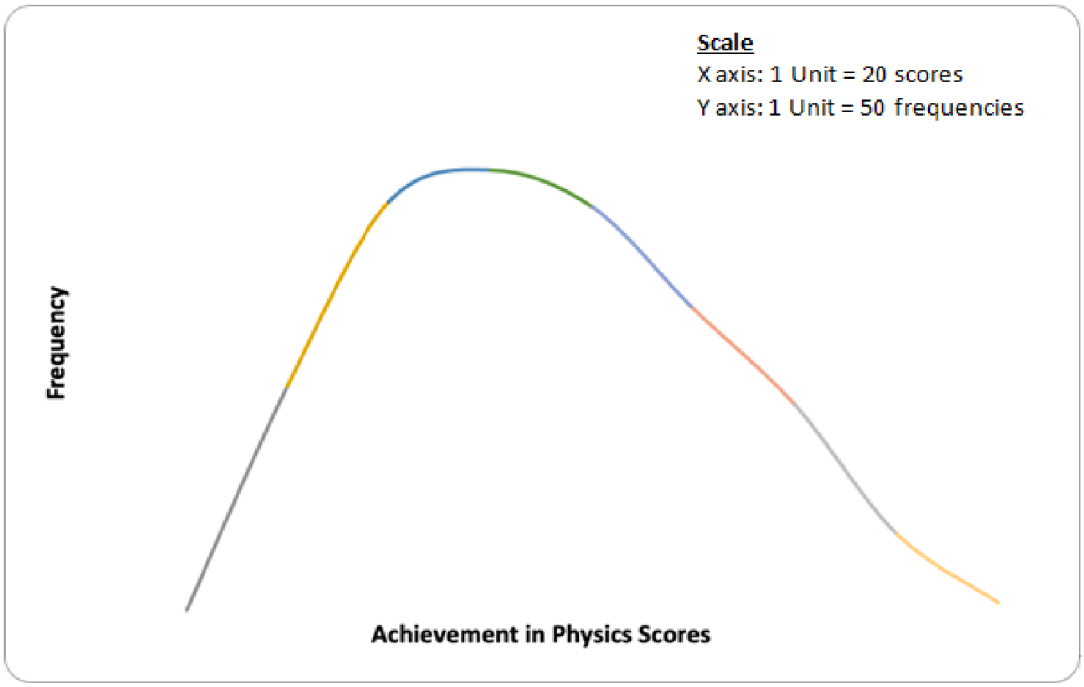


Figure 2

Smoothed Frequency for Achievement in Chemistry for Total Sample

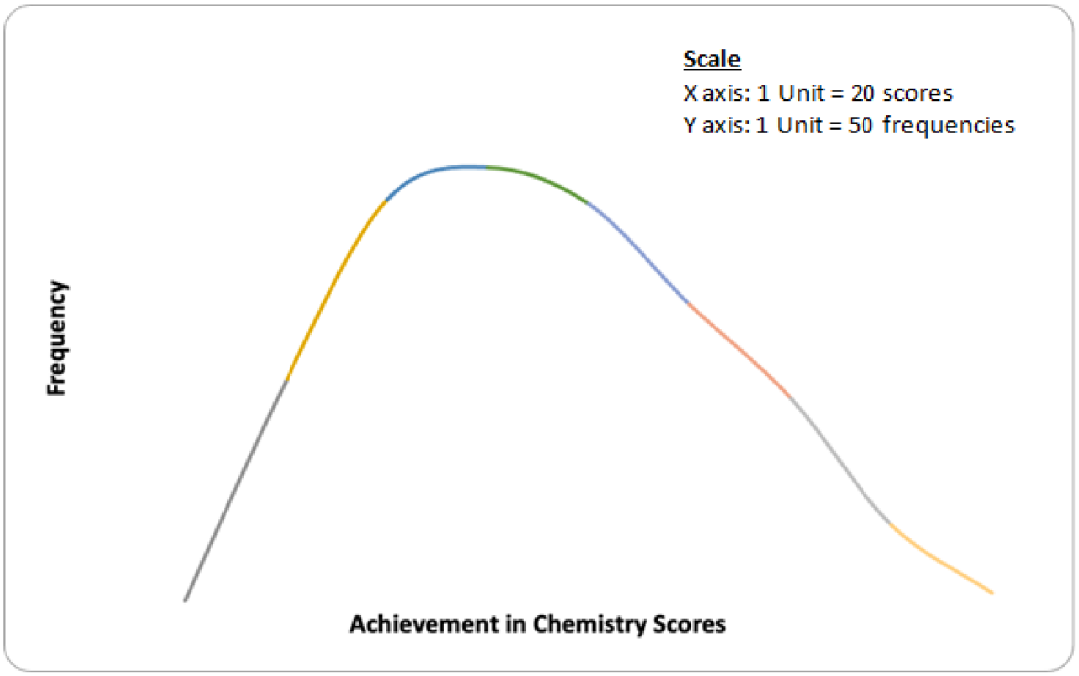


Figure 3

Smoothed Frequency Curve for Proficiency in English for Total Sample

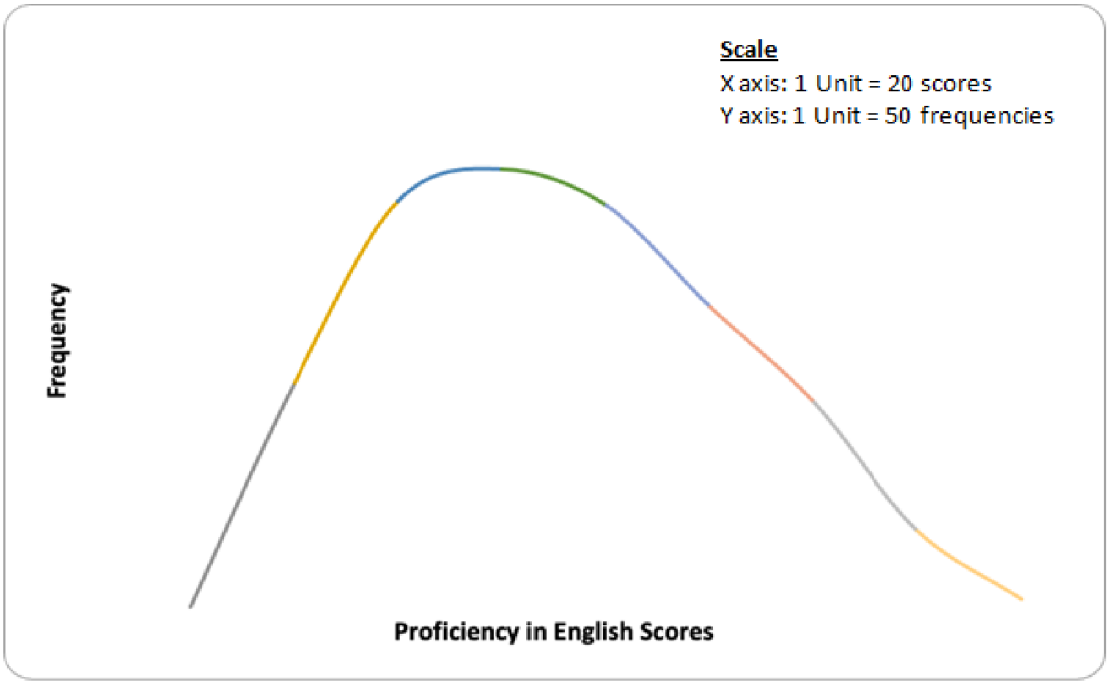


Figure 4

Smoothed Frequency Curve for Socio Economic Status for Total Sample

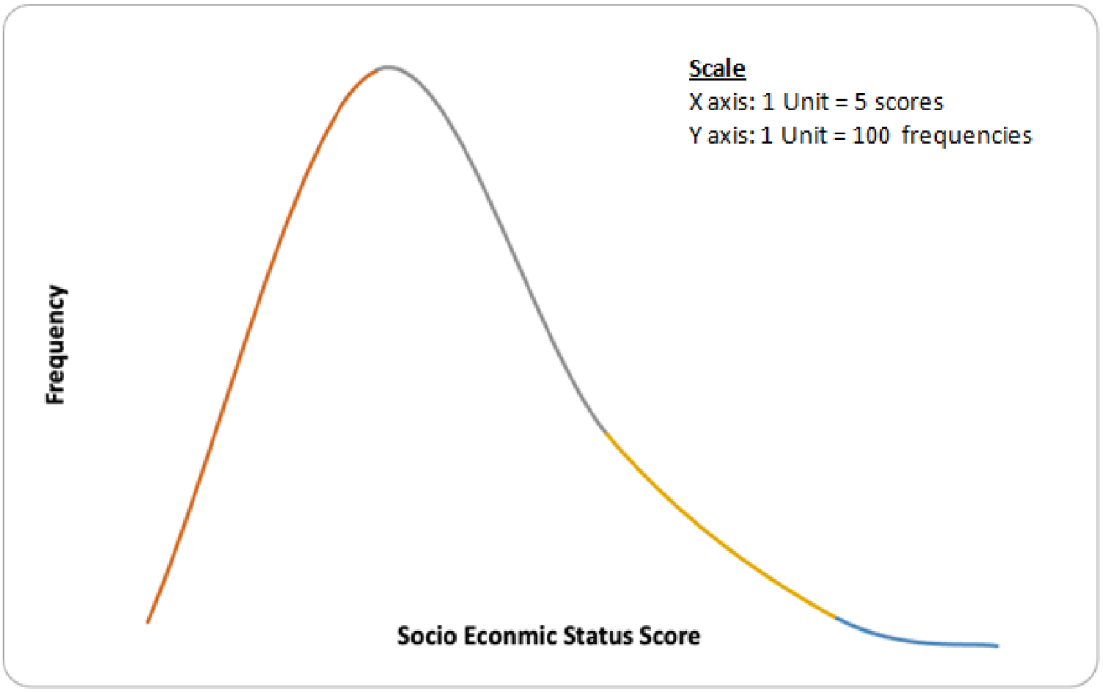
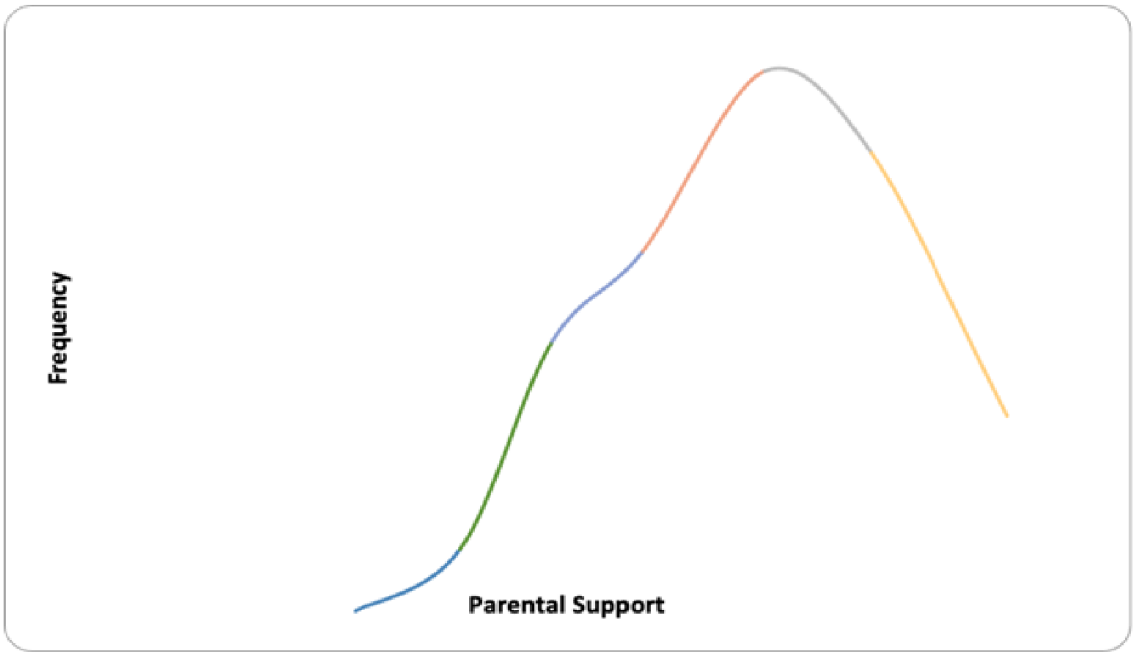


Figure 5

Smoothed Frequency Curve for Parental Support for Total Sample



Percentile Points

Percentile points of the scores of the Achievement in Physics, Achievement in Chemistry and Proficiency in English Measures P_{10}, P_{20}, P_{30}, P_{40}, P_{50}, P_{60}, P_{70}, P_{80}, P_{90}, were also calculated. The points are given in Table 20.

Table 20

Details of the Percentile Points and Percentile of Scores of Achievement in Physics, Achievement in Chemistry and Proficiency in English for the Total Sample

Percentile Point	Percentile Value Achievement in Physics	Percentile Value Achievement in Chemistry	Percentile Value Proficiency in English
P_{10}	32	29	28
P_{20}	35	34.8	33
P_{30}	41	38	36
P_{40}	45	44	42
P_{50}	53	47	47
P_{60}	59	53	53
P_{70}	65	59.9	58
P_{80}	74	68	64
P_{90}	79	76	72

Data in the Table 20 reveals that 10 percent of the individual's score of Achievement in physics is less than 32, Achievement in chemistry it is less than 29 and in Proficiency in English it is less than 28. 20 percent of individual's score are less than 35, 34.8 and 33, 30 percent of the individual's score are less than 41, 38 and 36 and 40 percent of the individual's scores are less than 45, 44 and 42 for Achievement in Physics, Achievement Chemistry and Proficiency in English respectively.

Test of Significance of Difference between Mean Scores

The group difference in the two variables were found out from the mean and standard deviation.

The difference between the mean scores of the comparable groups were tested using a two-tailed test of significance. For two tailed test critical ratio exceeding 2.58 was considered significant at 0.01 level. Critical ratio exceeding 1.96 was treated as significant at 0.05 level.

(a) Gender Difference

Critical ratio for difference between mean scores of Achievement in Physics, Achievement in Chemistry, Proficiency in English, Socio Economic Status and Parental Support for boys and girls were calculated. Data and the result of the test of significance are presented in the Table 21.

Table 21

Details of the Test of Significance for the Difference between the Mean Scores of Achievement in Physics, Achievement in Chemistry, Proficiency in English, Socio Economic Status and Parental Support for Boys and Girls

Sl. No.	Variables Compared	Group Compared	Mean	Standard Deviation	Critical Ratio
1	Achievement in Physics	Boys	49.50	18.73	-8.07**
		Girls	58.49	17.99	
2	Achievement in Chemistry	Boys	46.30	17.54	-7.99**
		Girls	54.84	17.40	
3	Proficiency in English	Boys	44.77	17.06	-6.84**
		Girls	51.82	16.79	
4	Socio Economic Status	Boys	17.57	5.48	-1.63
		Girls	18.13	5.87	
5	Parental Support	Boys	22.75	4.31	-4.48**
		Girls	23.94	4.13	

**0.01 level of significance

Critical ratio obtained from Table 21 between the sub samples boys and girls for the variables Achievement in Physics, Achievement in Chemistry, Proficiency in English, Socio Economic Status and Parental Support were -8.07, -7.99, -6.84, -1.63 and -4.48 respectively. The critical ratios for Achievement in Physics, Achievement in Chemistry, Proficiency in English and Parental Support were greater than the limit set for 0.01 level of significance. This shows that Achievement in Physics, Achievement in Chemistry, Proficiency in English, and Parental Support differ significantly between boys and girls. The critical ratio obtained for Socio Economic Status was less than the limit set for 0.05 level of significance. This shows that Critical ratio obtained for subsamples boys and girls for the variable Socio Economic Status does not differ significantly .

b) Locale Difference

Critical ratio for difference between mean scores of the students of Urban and Rural schools for Achievement in Physics, Achievement in Chemistry, Proficiency in English, Socio Economic Status and Parental Support were calculated. Data and the result of the test of significance for difference between mean scores are presented in Table 22.

Table 22

Details of Test of Significance of difference between the Mean Scores of Selected Variables for Students of Urban schools and Rural Schools

Sl No	Variables Compared	Group Compared	Mean	Standard Deviation	Critical Ratio
1	Achievement in Physics	Urban	53.87	18.97	-0.21
		Rural	54.12	18.84	
2	Achievement in Chemistry	Urban	51.26	18.32	1.23
		Rural	49.89	17.62	
3	Proficiency in English	Urban	48.69	16.69	0.73
		Rural	47.90	17.86	
4	Socio Economic Status	Urban	18.30	5.90	2.44*
		Rural	17.40	5.44	
5	Parental Support	Urban	23.41	4.35	0.45
		Rural	23.28	4.17	

*0.05 level of significance

Critical ratio obtained for subsample, students of the urban schools and rural schools for the variables Achievement in Physics, Achievement in Chemistry, Proficiency in English, Socio Economic Status and Parental Support were -0.21, 1.23, 0.73, 2.44 and 0.45 respectively. The critical ratios for Achievement in Physics, Achievement in Chemistry, Proficiency in English and Parental Support were less than the limit set for 0.05 level of significance. This shows that Achievement in Physics, Achievement in Chemistry, Proficiency in English and Parental Support do not differ significantly between students of urban schools and students of rural schools . The critical ratio for Socio Economic Status was greater than the limit set for 0.05 level of significance. This shows that Socio Economic Status differ significantly between students of urban and rural schools.

The critical ratio for Socio Economic Status indicates that the Socio Economic Status of the students of urban schools are higher than that of the students of rural schools.

c) Difference based on Type of Management

Critical ratio for difference between mean scores of students of Government and Private schools in Achievement in Physics, Achievement in Chemistry, Proficiency in English, Socio Economic Status and Parental Support were calculated. Data and the result of the test of significance are presented in Table 23.

Table 23

Details of Test of Significance for Difference between the Mean Scores of Selected Variables on the Basis of type of Management of the Schools

Sl. No.	Variables Compared	Group Compared	Mean	Standard Deviation	Critical Ratio
1	Achievement in Physics	Government	55.27	17.55	2.12*
		Private	52.73	20.09	
2	Achievement in Chemistry	Government	51.44	17.33	1.46
		Private	49.71	18.57	
3	Proficiency in English	Government	50.97	17.02	4.92**
		Private	45.61	17.14	
4	Socio Economic Status	Government	18.29	5.60	2.40*
		Private	17.41	5.74	
5	Parental Support	Government	23.15	3.99	-1.52
		Private	23.54	4.50	

Note: * indicates 0.05 level of significance

**indicates 0.01 level of significance

Critical ratio obtained from Table 23 for students of government schools and students of private schools for the variables Achievement in Physics, Achievement in Chemistry, Proficiency in English, Socio Economic Status and Parental Support were 2.12, 1.46, 4.92, 2.40 and -1.52 respectively. The critical ratio for Achievement in Physics was greater than the limit set for 0.05 level of significance. This shows that Achievement in Physics differ significantly between students of government schools and students of private schools. The critical ratio for Achievement in Chemistry is less than the limit set for 0.05 level of significance. This shows that Achievement in Chemistry does not differ significantly between students of government schools and students of private schools. The critical ratio for proficiency in English was greater than the limit set for 0.01 level of significance. This shows that proficiency in English differ significantly between students of government and private schools. The Critical ratio obtained for Socio Economic Status was 2.40 which is greater than the limit set for 0.05 level of significance. This shows that Socio Economic Status of the students of government schools is higher than that of students of private schools. The critical ratio for Parental Support is less than the limit set for 0.05 level of significance. This shows that Achievement in Chemistry and Parental Support do not differ significantly between the students of government schools and students of private schools.

Discussion

For the test of significance (‘t’ test) of difference between means for relevant subsamples based on gender of students, locality and type of management of the schools, the following results were obtained.

In the case of gender, it was evidenced that Achievement in Physics, Achievement in Chemistry and Proficiency in English were higher for girls than that of boys. There was no significant difference between boys and girls in their Socio Economic Status. The Parental Support for girls was significantly higher than that of boys.

There was 0.05 level of significance between the students of urban schools and students of rural schools in their Socio Economic Status. The high mean of the students in government schools in their Socio Economic Status Scale indicated that the Socio Economic Status of the urban students was better than that of rural students. The results showed that students of urban schools and students of rural schools were almost identical in their Achievement in Physics, Achievement in Chemistry, Proficiency in English and in Parental Support but the Socio Economic Status of the students of urban schools were higher than that of the students of rural schools.

In the case of students of government schools and students of private schools, there was significant difference in the mean scores of Achievement in Physics and Proficiency in English. The result showed that students of government schools were better than the students of private schools in their Achievement in Physics and Proficiency in English. There was significant difference in the mean scores of Socio Economic Status. The mean scores for Socio Economic Status of students of government schools is higher than that of students of private schools which revealed that the Socio Economic Status of students in government schools was better than that of the students of private schools. This may be due to the fact that most of the government schools are situated in the urban area. There was no significant difference between the mean

scores of students of government schools and students of private schools in their Parental Support.

Correlation Analysis

Under this section estimation of the extent of relationships among Achievement in Physics, Achievement in Chemistry, Proficiency in English, Socio Economic Status and Parental Support were done. Correlation is the relationship between two or more paired variables, the degree of which is measured by the Pearson's product Moment Coefficient of Correlation. The Independent Variable of the study are Proficiency in English, Socio Economic Status and Parental Support. The relationship of these variables to the dependent variables, Achievement in Physics and Achievement in Chemistry (Achievement in Physical Science) with the total sample and subsamples based on gender, locale and type of management of schools are discussed below.

For interpreting 'r' in addition to the verbal interpretation, indices like level of significance, confidence intervals and shared variance 'r^2' also were calculated. Each of the coefficient of correlation 'r' was tested for significance.

A. Relationship among the Achievement in Physical Science and Selected Contextual factors for the Total Sample (N=1000)

The details of the relationships among Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) and Proficiency in English, Socio Economic Status and Parental Support together with percentage of overlap and confidence intervals obtained for total sample (N=1000) are presented in Table 24.

Table 24

Details of the Relationship among Achievement in Physical Science and Proficiency in English, Socio Economic Status and Parental Support for Total Sample

Sl. No.	Variable Compared	r	Percentage Overlap r^2 x 100	Confidence Interval		Level of Significance
				Lower limit	Upper limit	
1.	Achievement in Physics & Proficiency in English	0.66	43.56	0.61	0.71	0.01
2.	Achievement in Physics & Socio Economic Status	0.28	7.84	0.21	0.36	0.01
3.	Achievement in Physics &Parental Support	0.23	5.29	0.15	0.31	0.01
4.	Achievement in Chemistry & Proficiency in English	0.66	43.56	0.61	0.71	0.01
5.	Achievement in Chemistry & Socio Economic Status	0.31	9.61	0.24	0.38	0.01
6.	Achievement in Chemistry & Parental Support	0.19	3.61	0.11	0.27	0.01

Interpretation of the Results

1. Achievement in Physics and Proficiency in English for Total Sample

r = 0.66

r^2 x 100 = 43.56.

CI 0.99 = (0.61, 0.71)

The coefficient of correlation between Achievement in Physics and Proficiency in English for the whole sample is 0.66 indicating that the

relationship between these variables for the sample is real. The relationship can be verbally interpreted as 'substantial or marked'.

The value of r is positive which shows further that any increase in the Proficiency in English will result in an increase in the Achievement in Physics and vice versa.

The shared variance (percentage overlap) of Achievement in Physics with Proficiency in English is 43.56. It shows that 43.56 percent variance of the Achievement in Physics is attributable to Proficiency in English.

The confidence interval of the correlation is (0.61, 0.71) indicating that if the correlation between the same variable is worked out for the whole population it will lie between 0.61 and 0.71 at 0.99 probability.

2. Achievement in Physics and Socio Economic Status for Total Sample

$r = 0.28$

$r^2 \times 100 = 7.84$

CI 0.99 = (0.21, 0.36)

The coefficient of correlation between Achievement in Physics and Socio Economic Status for the total sample is 0.28, which shows that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as low.

The value of r is positive indicating further that the more the increase in the Socio Economic Status the more the increase in the Achievement in Physics and vice versa.

The shared variance (percentage overlap) of Achievement in Physics with Socio Economic Status is 7.84 indicating that 7.84 percent variance of the Achievement in Physics is attributable to Proficiency in English.

The confidence interval of the correlation is (0.21, 0.36) which indicates that if the correlation between the same variable is worked out for the whole population it will lie between 0.21 and 0.36 at 0.99 probability.

3. Achievement in Physics and Parental Support for Total Sample

$r = 0.23$

$r^2 \times 100 = 5.29$

CI 0.99 = (0.15, 0.31)

The coefficient of correlation between Achievement in Physics and Parental support for the whole sample is 0.23, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as low.

The value of r is positive which indicates further that any increase in the Parental Support will result in an increase in Achievement in Physics and vice versa.

The shared variance (percentage overlap) of Achievement in Physics with Parental support is 5.29. This shows 5.29 percent variance of the Achievement in Physics is attributable to the Parental support.

The confidence interval of the correlation is (0.15, 0.31) indicating that if the correlation between the same variable is worked out for the whole population the ‘r’ will lie between 0.15 and 0.31 at 0.99 probability.

4. Achievement in Chemistry and Proficiency in English for Total Sample

r = 0.66

r^2 x 100 = 43.56

CI 0.99 = (0.61, 0.71)

The coefficient of correlation between Achievement in Chemistry and Proficiency in English for the whole sample is 0.66, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as substantial or marked.

The value of r is positive indicating further that any increase in the Proficiency in English will result in an increase in Achievement in Chemistry and vice versa.

The shared variance (percentage overlap) of Achievement in Chemistry with Proficiency in English is 43.56 which shows 43.56 percent variance of the Achievement in Chemistry is attributable to Proficiency in English.

The confidence interval of the correlation is (0.61, 0.71). This indicates that if the correlation between the same variable is worked out for the whole population it will lie between 0.61 and 0.71 at 0.99 probability.

5. Achievement in Chemistry and Socio Economic Status for Total Sample

r = 0.31

r^2 x 100 = 9.61

CI 0.99 = (0.24, 0.38)

The coefficient of correlation between Achievement in Chemistry and Socio Economic Status for the whole sample is 0.31, which suggests that the

relationship between these variables for the sample is real. The relationship can be verbally interpreted as low.

The value of r is positive indicating further that any increase in the Socio Economic Status will result in an increase in Achievement in Chemistry and vice versa.

The shared variance (percentage overlap) of Achievement in Chemistry with Socio Economic Status is 9.61. This shows 9.61 percent variance of the Achievement in Chemistry is attributable to the Socio Economic Status.

The confidence interval of the correlation is (0.24, 0.38) indicating that if the correlation between the same variable is worked out for the whole population it will lie between 0.24 and 0.38 at 0.99 probability.

6. Achievement in Chemistry and Parental Support for Total Sample

r = 0.19

r^2 x 100 = 3.61

CI 0.99 = (0.11, 0.27)

The coefficient of correlation between Achievement in Chemistry and Parental support for the whole sample is 0.19, which shows that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as negligible.

The value of r is positive indicating further that any increase in the Parental support will result in an increase in Achievement in Chemistry and vice versa.

The shared variance (percentage overlap) of Achievement in Chemistry with Parental support is 3.61. This shows 3.61 percent variance of the Achievement in Chemistry is attributable to the Parental support.

The confidence interval of the correlation is (0.11, 0.27) which indicates that if the correlation between the same variable is worked out for the whole population it will lie between 0.11 and 0.27 at 0.99 probability.

B. Relationship among the Achievement in Physics and Selected Contextual Factors for Gender Groups

The details of the relationships among the Achievement in Physics and Proficiency in English, Socio Economic Status and Parental Support, together with confidence intervals and percentage of overlap obtained for Boys and Girls are presented in Table 25.

Table 24

Details of the Relationship among Achievement in Physics and Proficiency in English, Socio Economic Status and Parental Support for Boys and Girls (N= 500)

Sl No	Variable Compared	Sample	r	Percentage Overlap r^2 x 100	Confidence Interval		Level of Significance
					Lower limit	Upper limit	
1.	Achievement in Physics & Proficiency in English	Boys	0.66	43.56	0.60	0.73	0.01
2.	Achievement in Physics & Proficiency in English	Girls	0.62	38.44	0.55	0.69	0.01
3.	Achievement in Physics & Socio Economic Status	Boys	0.28	7.84	0.17	0.39	0.01
4.	Achievement in Physics & Socio Economic Status	Girls	0.27	7.29	0.16	0.38	0.01
5.	Achievement in Physics & Parental Support	Boys	0.26	6.76	0.15	0.37	0.01
6.	Achievement in Physics & Parental Support	Girls	0.14	1.96	0.03	0.25	0.01

1. Achievement in physics and Proficiency in English for Boys

r = 0.66

r^2 x 100 = 43.56

CI 0.99 = (0.60, 0.73)

The coefficient of correlation between Achievement in Physics and Proficiency in English for the subsample boys is 0.66, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as substantial or marked.

The value of r is positive indicating further that any increase in the Proficiency in English will result in an increase in Achievement in Physics and vice versa.

The shared variance (percentage overlap) of Achievement in Physics with Proficiency in English is 43.56. This shows 43.56 percent variance of the Achievement in Physics is attributable to the Proficiency in English

The confidence interval of the correlation is (0.60, 0.73) which indicates that if the correlation between the same variable is worked out for the whole population it will lie between 0.60 and 0.73 at 0.99 probability.

2. Achievement in physics and Proficiency in English for girls

r = 0.62

r^2 x 100 = 38.44

CI 0.99 = (0.55, 0.69)

The coefficient of correlation between Achievement in Physics and Proficiency in English for the subsample girls is 0.62, which suggests that the

relationship between these variables for the sample is real. The relationship can be verbally interpreted as substantial or marked.

The value of r is positive indicating further that any increase in the Proficiency in English will result in an increase in Achievement in Physics based on the subsample girls.

The shared variance (percentage overlap) of Achievement in Physics with Proficiency in English is 38.44. This shows 38.44 percent variance of the Achievement in Physics is attributable to the Proficiency in English for the subsample girls.

The confidence interval of the correlation is (0.55, 0.69) indicating that if the correlation between the same variable is worked out for the whole population it will lie between 0.55 and 0.69 at 0.99 probability.

3. Achievement in physics and Socio Economics Status for Boys

$r = 0.28$

$r^2 \times 100 = 7.84$

CI 0.99 = (0.17, 0.39)

The coefficient of correlation between Achievement in Physics and Socio Economic Status for the boys is 0.28, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as low.

The value of r is positive indicating further that any increase in the Socio Economic Status will result in an increase in Achievement in Physics and vice versa.

The shared variance (percentage overlap) of Achievement in Physics with Socio Economic Status is 7.84. This shows 7.84 percent variance of the Achievement in Physics is attributable to the Socio Economic Status.

The confidence interval of the correlation is (0.17, 0.39) which indicates that if the correlation between the same variable is worked out for the whole population it will lie between 0.17 and 0.39 at 0.99 probability.

4. Achievement in Physics and Socio Economic Status for Girls

r = 0.27

r^2 x 100 = 7.29

CI 0.99 = (0.16, 0.38)

The coefficient of correlation between Achievement in Physics and Socio Economic Status for the subsample girls is 0.27, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as low.

The value of r is positive indicating further that any increase in Socio Economic Status will result in an increase in Achievement in Physics and vice versa.

The shared variance (percentage overlap) of Achievement in Physics with Socio Economic Status is 7.29. This shows 7.29 percent variance of the Achievement in Physics is attributable to the Socio Economic Status for the girls.

The confidence interval of the correlation is (0.16, 0.38) indicating that if the correlation between the same variable is worked out for the whole population it will lie between 0.16 and 0.38 at 0.99 probability.

5. Achievement in physics and Parental Support for Boys

$r = 0.26$

$r^2 \times 100 = 6.76$

CI 0.99 = (0.15, 0.37)

The coefficient of correlation between Achievement in Physics and Parental Support for the boys is 0.26, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as low.

The value of r is positive indicating further that any increase in the Parental Support will result in an increase in Achievement in Physics and vice versa.

The shared variance (percentage overlap) of Achievement in Physics with Parental Support is 6.76. This shows 6.76 percent variance of the Achievement in Physics is attributable to the Parental Support.

The confidence interval of the correlation is (0.15, 0.37) which indicates that if the correlation between the same variable is worked out for the whole population it will lie between 0.15 and 0.37 at 0.99 probability.

6. Achievement in physics and Parental Support for Girls

$r = 0.14$

$r^2 \times 100 = 1.96$

CI 0.99 = (0.03, 0.25)

The coefficient of correlation between Achievement in Physics and Parental Support for the subsample girls is 0.14, which suggests that the

relationship between these variables for the sample is real. The relationship can be verbally interpreted as negligible.

The value of r is positive indicating further that any increase in Parental Support will result in an increase in Achievement in Physics and vice versa.

The shared variance (percentage overlap) of Achievement in Physics with Parental Support is 1.96 This shows 1.96 percent variance of the Achievement in Physics is attributable to the Parental Support for the girls.

The confidence interval of the correlation is (0.03, 0.25) indicating that if the correlation between the same variable is worked out for the whole population it will lie between 0.03 and 0.25 at 0.99 probability.

C. Relationship among the Achievement in Chemistry, and Proficiency in English, and Selected Contextual Factors for Gender Groups

The details of the relationships among the Achievement in Chemistry and Proficiency in English, Socio Economic Status and Parental Support, together with confidence intervals and percentage of overlap obtained for Boys and Girls are presented in the following Table 26.

Table 26

Details of the Relationship among Achievement in Chemistry and Proficiency in English, Socio Economic Status and Parental Support for Boys and Girls (N= 500)

Sl No	Variable Compared	Sample	r	Percentage Overlap r^2 x100	Confidence Interval		Level of Significance
					Lower limit	Upper limit	
1.	Achievement in Chemistry & Proficiency in English	Boys	0.64	40.96	0.57	0.71	0.01
2.	Achievement in Chemistry & Proficiency in English	Girls	0.63	39.69	0.56	0.70	0.01
3.	Achievement in Chemistry & Socio Economic Status	Boys	0.32	10.24	0.22	0.42	0.01
4.	Achievement in Chemistry & Socio Economic Status	Girls	0.30	9.00	0.20	0.41	0.01
5.	Achievement in Chemistry & Parental Support	Boys	0.19	3.61	0.08	0.30	0.01
6.	Achievement in Chemistry & Parental Support	Girls	0.14	1.96	0.03	0.25	0.01

1. Achievement in Chemistry and Proficiency in English for Boys

r = 0.64

r^2 x 100 = 40.96

CI 0.99 = (0.57, 0.71)

The coefficient of correlation between Achievement in Chemistry and Proficiency in English for the subsample boys is 0.64, which suggests that the

relationship between these variables for the sample is real. The relationship can be verbally interpreted as substantial or marked.

The value of r is positive indicating further that any increase in the Proficiency in English will result in an increase in Achievement in Chemistry and vice versa for the subsample boys.

The shared variance (percentage overlap) of Achievement in Chemistry with Proficiency in English is 40.96. This shows 40.96 percent variance of the Achievement in Chemistry is attributable to the Proficiency in English.

The confidence interval of the correlation is (0.57, 0.71) indicating that if the correlation between the same variable is worked out for the whole population it will lie between 0.57 and 0.71 at 0.99 probability.

2. Achievement in Chemistry and Proficiency in English for Girls

$r = 0.63$

$r^2 \times 100 = 39.69$

CI 0.99 = (0.56, 0.70)

The coefficient of correlation between Achievement in Chemistry and Proficiency in English for the subsample girls is 0.63, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as substantial or marked.

The value of r is positive indicating further that any increase in the Proficiency in English will result in an increase in Achievement in Chemistry and vice versa for girls.

The shared variance (percentage overlap) of Achievement in Chemistry with Proficiency in English is 39.69 which shows 39.69 percent variance of the Achievement in Chemistry is attributable to the Proficiency in English for the subsample girls.

The confidence interval of the correlation is (0.56, 0.70) indicating that if the correlation between the same variable is worked out for the whole population it will lie between 0.56 and 0.70 at 0.99 probability.

3. Achievement in Chemistry and Socio Economic Status for Boys

$r = 0.32$

$r^2 \times 100 = 10.24$

CI 0.99 = (0.22, 0.42)

The coefficient of correlation between Achievement in Chemistry and Socio Economic Status for the subsample boys is 0.32, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as low.

The value of r is positive indicating further that any increase in the Socio Economic Status will result in an increase in Achievement in Chemistry and vice versa for the boys.

The shared variance (percentage overlap) of Achievement in Chemistry with Socio Economic Status 10.24. This shows 10.24 percent variance of the Achievement in Chemistry is attributable to the Socio Economic Status.

The confidence interval of the correlation is (0.22, 0.42) indicating that if the correlation between the same variable is worked out for the whole population it will lie between 0.22 and 0.42 at 0.99 probability.

4. Achievement in Chemistry and Socio Economic Status for Girls

r = 0.30

r^2 x 100 = 9.00

CI 0.99 = (0.20, 0.41)

The coefficient of correlation between Achievement in Chemistry and Socio Economic Status for the subsample girls is 0.30, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as low.

The value of r is positive indicating further that any increase in the Socio Economic Status will result in an increase in Achievement in Chemistry and vice versa for subsample girls.

The shared variance (percentage overlap) of Achievement in Chemistry with Socio Economic Status is 9.00. This shows 9.00 percent variance of the Achievement in Chemistry is attributable to the Socio Economic Status for girls.

The confidence interval of the correlation is (0.20, 0.41) which indicates that if the correlation between the same variable is worked out for the whole population it will lie between 0.20 and 0.41 at 0.99 probability.

5. Achievement in Chemistry and Parental Support for Boys

r = 0.19

r^2 x 100 = 3.61

CI 0.99 = (0.08, 0.30)

The coefficient of correlation between Achievement in Chemistry and Parental Support for the subsample boys is 0.19, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as negligible.

The value of r is positive indicating further that any increase in the Parental Support will result in an increase in Achievement in Chemistry and vice versa for boys.

The shared variance (percentage overlap) of Achievement in Chemistry with Parental Support is 3.61. This shows 3.61 percent variance of the Achievement in Chemistry is attributable to the Parental Support.

The confidence interval of the correlation is (0.08, 0.30) indicating that if the correlation between the same variable is worked out for the whole population it will lie between 0.08 and 0.30 at 0.99 probability.

6. Achievement in Chemistry and Parental Support for Girls

$r = 0.14$

$r^2 \times 100 = 1.96$

CI 0.99 = (0.03, 0.25)

The coefficient of correlation between Achievement in Chemistry and Parental Support for the subsample girls is 0.14, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as negligible.

The value of r is positive indicating further that any increase in the Parental Support will result in an increase in Achievement in Chemistry and vice versa for girls.

The shared variance (percentage overlap) of Achievement in Chemistry with Parental Support is 1.96. This shows 1.96 percent variance of the Achievement in Chemistry is attributable to Parental Support.

The confidence interval of the correlation is (0.03, 0.25) which indicates that if the correlation between the same variable is worked out for the whole population it will lie between 0.03 and 0.25 at 0.99 probability.

D. Relationship among Achievement in Physics, Proficiency in English, and Selected Contextual factors for the Subsample based on Locality of Schools

The details of the relationships among the Achievement in Physics and Proficiency in English, Socio Economic Status and Parental Support, together with confidence intervals and percentage of overlap obtained for Students of Urban Schools and Students of Rural Schools are presented in the following Table 27.

Table 27

Details of the Relationship among Achievement in Physics and Proficiency in English, Socio Economic Status and Parental Support for Students of Urban and Rural Schools (N=500)

Sl. No	Variable Compared	Sample	r	Percentage Overlap. r^2 x 100	Confidence Interval		Level of Significance
					Lower limit	Upper limit	
1.	Achievement in Physics &Proficiency in English	Urban	0.63	39.69	0.56	0.70	0.01
2.	Achievement in Physics &Proficiency in English	Rural	0.68	46.24	0.62	0.74	0.01
3.	Achievement in Physics &Socio Economic Status	Urban	0.24	5.76	0.13	0.35	0.01
4.	Achievement in Physics &Socio Economic Status	Rural	0.32	10.24	0.22	0.42	0.01
5.	Achievement in Physics & Parental Support	Urban	0.25	6.25	0.14	0.36	0.01
6.	Achievement in Physics & Parental Support	Rural	0.20	4.00	0.09	0.31	0.01

1. Achievement in Physics and Proficiency in English for the Students of Urban Schools

r = 0.63

r^2 x 100 = 39.69

CI 0.99 = (0.56, 0.70)

The coefficient of correlation between Achievement in Physics and Proficiency in English for the students of urban schools is 0.63, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as substantial or marked.

The value of r is positive indicating further that any increase in the Proficiency in English will result in an increase in Achievement in Physics and vice versa for students of urban schools.

The shared variance (percentage overlap) of Achievement in Physics with Proficiency in English is 39.69. This shows 39.69 percent variance of the Achievement in Physics is attributable to the Proficiency in English for the subsample; students of urban schools.

The confidence interval of the correlation is (0.56, 0.70) indicating that if the correlation between the same variable is worked out for the whole population it will lie between 0.56 and 0.70 at 0.99 probability.

2. Achievement in Physics and Proficiency in English for the Students in Rural Schools

r = 0.68

r^2 x 100 = 46.24

CI 0.99 = (0.62, 0.74)

The coefficient of correlation between Achievement in Physics and Proficiency in English for the subsample; students in rural the schools is 0.68,

which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as substantial or marked.

The value of r is positive indicating further that any increase in the Proficiency in English will result in an increase in Achievement in Physics and vice versa for the students of rural schools.

The shared variance (percentage overlap) of Achievement in Physics with Proficiency in English is 46.24. This shows 46.24 percent variance of the Achievement in Physics is attributable to Proficiency in English for the subsample; students in rural the schools.

The confidence interval of the correlation is (0.62, 0.74) which indicates that if the correlation between the same variable is worked out for the whole population it will lie between 0.62 and 0.74 at 0.99 probability.

3. Achievement in Physics and Socio Economic Status for Students in Urban Schools

r = 0.24

r^2 x 100 = 5.76

CI 0.99 = (0.13, 0.35)

The coefficient of correlation between Achievement in Physics and Socio Economic Status for the subsample students of urban schools is 0.24, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as low.

The value of r is positive indicating further that any increase in the Socio Economic Status will result in an increase in Achievement in Physics and vice versa for students of urban schools.

The shared variance (percentage overlap) of Achievement in Physics with Socio Economic Status is 5.76. This shows 5.76 percent variance of the Achievement in Physics is attributable to the Socio Economic Status for the subsample students of urban schools.

The confidence interval of the correlation is (0.13, 0.35) indicating that if the correlation between the same variable is worked out for the whole population it will lie between 0.13 and 0.35 at 0.99 probability.

4. Achievement in Physics and Socio Economic Status for Students in Rural Schools

r = 0.32

r^2 x 100 = 10.24

CI 0.99 = (0.22, 0.42)

The coefficient of correlation between Achievement in Physics and Socio Economic Status for the subsample students of rural schools is 0.32, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as low.

The value of r is positive indicating further that any increase in the Socio Economic Status will result in an increase in Achievement in Physics and vice versa for the subsample students of rural schools.

The shared variance (percentage overlap) of Achievement in Physics with Socio Economic Status is 10.24. This shows 10.24 percent variance of the Achievement in Physics is attributable to the Socio Economic Status for the subsample students of rural schools.

The confidence interval of the correlation is (0.22, 0.42) which indicates that if the correlation between the same variable is worked out for the whole population it will lie between 0.22 and 0.42 at 0.99 probability.

5. Achievement in Physics and Parental Support for Students of Urban Schools

r = 0.25

r^2 x 100 = 6.25

CI 0.99 = (0.14, 0.36)

The coefficient of correlation between Achievement in Physics and Parental Support for the subsample students of urban schools is 0.25, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as low.

The value of r is positive indicating further that any increase in the Parental Support will result in an increase in Achievement in Physics and vice versa for the subsample students of urban schools.

The shared variance (percentage overlap) of Achievement in Physics with Parental Support is 6.25. This shows 6.25 percent variance of the Achievement in Physics is attributable to the Parental Support for the subsample students of urban schools.

The confidence interval of the correlation is (0.14, 0.36). This indicates that if the correlation between the same variable is worked out for the whole population it will lie between 0.14 and 0.36 at 0.99 probability.

6. Achievement in physics and Parental Support for the Students in Rural Schools

r = 0.20

r^2 x 100 = 4.00

CI 0.99 = (0.09, 0.31)

The coefficient of correlation between Achievement in Physics and Parental Support for the subsample students of rural schools is 0.20, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as low.

The value of r is positive indicating further that any increase in the Parental Support will result in an increase in Achievement in Physics and vice versa for the subsample students of rural schools.

The shared variance (percentage overlap) of Achievement in Physics with Parental Support is 4.00. This shows 4.00 percent variance of the Achievement in Physics is attributable to the Parental Support for the students of rural schools.

The confidence interval of the correlation is (0.09, 0.31). This indicates that if the correlation between the same variable is worked out for the whole population it will lie between 0.09 and 0.31 at 0.99 probability.

E. Relationship among the Achievement in Chemistry, Proficiency in English and Selected Contextual Factors for the Subsample based on Locality

The details of the relationships among the Achievement in chemistry and Proficiency in English, Socio Economic Status and Parental Support, together with confidence intervals and percentage of overlap obtained for Students of Urban Schools and Students of Rural Schools are presented in the following Table 28

Table 28

Details of the Relationship among Achievement in Chemistry and Proficiency in English, Socio Economic Status and Parental Support for the Students of Urban and Rural Schools (N=500)

Sl No	Variable Compared	Sample	r	Percentage Overlap r^2 x 100	Confidence interval		Level of Significance
					Lower limit	Upper limit	
1.	Achievement in Chemistry & Proficiency in English	Urban	0.62	38.44	0.55	0.69	0.01
2.	Achievement in Chemistry & Proficiency in English	Rural	0.70	49	0.64	0.76	0.01
3.	Achievement in Chemistry &Socio Economic Status	Urban	0.27	7.29	0.16	0.38	0.01
4.	Achievement in Chemistry & Socio Economic Status	Rural	0.35	12.25	0.25	0.45	0.01
5.	Achievement in Chemistry & Parental Support	Urban	0.21	4.41	0.10	0.32	0.01
6.	Achievement in Chemistry & Parental Support	Rural	0.17	2.89	0.06	0.28	0.01

1. Achievement in Chemistry and Proficiency in English for Students in Urban Schools

r = 0.62

r^2 x 100 = 38.44

CI 0.99 = (0.55, 0.69)

The coefficient of correlation between Achievement in Chemistry and Proficiency in English for the subsample students of urban schools is 0.62, which

suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as substantial or marked.

The value of r is positive indicating further that any increase in the Proficiency in English will result in an increase in Achievement in Chemistry and vice versa for the subsample students of urban schools.

The shared variance (percentage overlap) of Achievement in Chemistry with Proficiency in English is 38.44. This shows 38.44 percent variance of the Achievement in Chemistry is attributable to Proficiency in English for the subsample students of urban schools.

The confidence interval of the correlation is (0.55, 0.69) which indicates that if the correlation between the same variable is worked out for the whole population it will lie between 0.55 and 0.69 at 0.99 probability.

2. Achievement in Chemistry and Proficiency in English for Students in Rural Schools

$r = 0.70$

$r^2 \times 100 = 49.00$

CI 0.99 = (0.64, 0.76)

The coefficient of correlation between Achievement in Chemistry and Proficiency in English for the subsample students of rural schools is 0.70, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as substantial or marked.

The value of r is positive indicating further that any increase in the Proficiency in English will result in an increase in Achievement in Chemistry and vice versa for the subsample; students of rural schools.

The shared variance (percentage overlap) of Achievement in Chemistry with Proficiency in English is 49.00. This shows 49.00 percent variance of the Achievement in Chemistry is attributable to Proficiency in English for the subsample; students of rural schools.

The confidence interval of the correlation is (0.64, 0.76) indicating that if the correlation between the same variable is worked out for the whole population it will lie between 0.64 and 0.76 at 0.99 probability.

3. Achievement in Chemistry and Socio Economic Status for Students in Urban Schools

r = 0.27

r^2 x 100 = 7.29

CI 0.99 = (0.16, 0.38)

The coefficient of correlation between Achievement in Chemistry and Socio Economic Status for the students of urban schools is 0.27, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as low.

The value of r is positive indicating further that any increase in the Socio Economic Status will result in an increase in Achievement in Chemistry and vice versa for the subsample students of urban schools.

The shared variance (percentage overlap) of Achievement in Chemistry with Socio Economic Status is 7.29. This shows 7.29 percent variance of the Achievement in Chemistry is attributable to the Socio Economic Status for the subsample students of urban schools.

The confidence interval of the correlation is (0.16, 0.38) indicating that if the correlation between the same variable is worked out for the whole population it will lie between 0.16 and 0.38 at 0.99 probability.

4. Achievement in Chemistry and Socio Economic Status for Students inRural Schools

r = 0.35

r^2 x 100 = 12.25

CI 0.99 = (0.25, 0.45)

The coefficient of correlation between Achievement in Chemistry and Socio Economic Status for the subsample students of rural schools is 0.35, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as low.

The value of r is positive indicating further that any increase in the Socio Economic Status will result in an increase in Achievement in Chemistry and vice versa for the subsample; students of rural schools.

The shared variance (percentage overlap) of Achievement in Chemistry with Socio Economic Status is 12.25. This shows 12.25 percent variance of the Achievement in Chemistry is attributable to the Socio Economic Status for the subsample; students of rural schools.

The confidence interval of the correlation is (0.25, 0.45) indicating that if the correlation between the same variable is worked out for the whole population it will lie between 0.25 and 0.45 at 0.99 probability.

5. Achievement in Chemistry and Parental Support for Students in Urban Schools

r = 0.21

r^2 x 100 = 4.41

CI 0.99 = (0.10, 0.32)

The coefficient of correlation between Achievement in Chemistry and Parental Support for the subsample the students of urban schools is 0.21, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as low.

The value of r is positive indicating further that any increase in the Parental Support will result in an increase in Achievement in Chemistry and vice versa for the students of urban schools.

The shared variance (percentage overlap) of Achievement in Chemistry with Parental Support is 4.41. This shows 4.41 percent variance of the Achievement in Chemistry is attributable to Parental Support for the subsample; students of urban schools.

The confidence interval of the correlation is (0.10, 0.32) which indicates that if the correlation between the same variable is worked out for the whole population it will lie between 0.10 and 0.32 at 0.99 probability.

6. Achievement in Chemistry and Parental Support for Students in Rural Schools

r = 0.17

r^2 x 100 = 2.89

CI 0.99 = (0.06, 0.28)

The coefficient of correlation between Achievement in Chemistry and Parental Support for students of rural schools is 0.17, which suggests that the

relationship between these variables for the sample is real. The relationship can be verbally interpreted as negligible.

The value of r is positive indicating further that any increase in the Parental Support will result in an increase in Achievement in Chemistry and vice versa for the subsample; the students of rural schools.

The shared variance (percentage overlap) of Achievement in Chemistry with Parental Support is 2.89. This shows 2.89 percent variance of the Achievement in Chemistry is attributable to the Parental Support for students of rural schools.

The confidence interval of the correlation is (0.06, 0.28) which indicates that if the correlation between the same variable is worked out for the whole population it will lie between 0.06 and 0.28 at 0.99 probability.

F. Relationship among the Achievement in Physics, Proficiency in English and Selected Contextual Factors for students under different management Category of Schools

The details of the relationships among the Achievement in Physics, Proficiency in English, Socio Economic Status and Parental Support together with confidence intervals and percentage of overlap obtained for relevant subsamples based on type of management of the school are presented in Table 29.

Table 29

Details of the Relationship among Achievement in Physics and Proficiency in English, Socio Economic Status and Parental Support for the Students of the Government (N=400) and Private (N=600) Schools

Sl No	Variable compared	Sample	R	Percentage Overlap r^2 x 100	Confidence Interval		Level of Significance
					Lower limit	Upper limit	
1.	Achievement in Physics &Proficiency in English	Govt.	0.63	39.69	0.56	0.70	0.01
2.	Achievement in Physics & Proficiency in English	Private	0.68	46.24	0.62	0.74	0.01
3.	Achievement in Physics &Socio Economic Status	Govt.	0.21	4.41	0.10	0.32	0.01
4.	Achievement in Physics &Socio Economic Status	Private	0.33	10.89	0.23	0.43	0.01
5.	Achievement in Physics & Parental Support	Govt.	0.12	1.44	0.01	0.23	0.01
6.	Achievement in Physics & Parental Support	Private.	0.32	10.24	0.22	0.42	0.01

1. Achievement in physics and Proficiency in English for the Students in Government Schools

r = 0.63

r^2 x 100 = 39.69

CI 0.99 = (0.56, 0.70)

The coefficient of correlation between Achievement in Physics and Proficiency in English for the students of government schools is 0.63, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as substantial or marked.

The value of r is positive indicating further that any increase in the Proficiency in English will result in an increase in Achievement in Physics and vice versa for the students of government schools .

The shared variance (percentage overlap) of Achievement in Physics with Proficiency in English is 39.69. This shows 39.69 percent variance of the Achievement in Physics is attributable to the Proficiency in English for the students of government schools.

The confidence interval of the correlation is (0.56, 0.70) which indicates that if the correlation between the same variable is worked out for the whole population it will lie between 0.56 and 0.70 at 0.99 probability.

2. Achievement in Physics and Proficiency in English for the Students in Private Schools

r = 0.68

r^2 x 100 = 46.24

CI 0.99 = (0.62, 0.74)

The coefficient of correlation between Achievement in Physics and Proficiency in English for the students of private school is 0.68, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as substantial or marked.

The value of r is positive indicating further that any increase in the Proficiency in English will result in an increase in Achievement in Physics and vice versa.

The shared variance (percentage overlap) of Achievement in Physics with Proficiency in English is 46.24. This shows 46.24 percent variance of the Achievement in Physics is attributable to the Proficiency in English for the students of private schools.

The confidence interval of the correlation is (0.62, 0.74). This indicates that if the correlation between the same variable is worked out for the whole population it will lie between 0.62 and 0.74 at 0.99 probability.

3. Achievement in Physics and Socio Economic Status for the Students in Government Schools

r = 0.21

r^2 x 100 = 4.41

CI 0.99 = (0.10, 0.32)

The coefficient of correlation between Achievement in Physics and Socio Economic Status for the students of government schools is 0.21, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as low.

The value of r is positive indicating further that any increase in the Socio Economic Status will result in an increase in Achievement in Physics and vice versa for students of the government schools.

The shared variance (percentage overlap) of Achievement in Physics with Socio Economic Status is 4.41 indicating that 4.41 percent variance of Achievement in Physics is attributable to Socio Economic Status for the students of government schools.

The confidence interval of the correlation is (0.10, 0.32) which indicates that if the correlation between the same variable is worked out for the whole population it will lie between 0.10 and 0.32 at 0.99 probability.

4. Achievement in Physics and Socio Economic Status for Students in Private Schools

$r = 0.33$

$r^2 \times 100 = 10.89$

CI 0.99 = (0.23, 0.43)

The coefficient of correlation between Achievement in Physics and Socio Economic Status for the students of private schools is 0.33, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as low.

The value of r is positive indicating further that any increase in the Socio Economic Status will result in an increase in Achievement in Physics and vice versa for students of private schools.

The shared variance (percentage overlap) of Achievement in Physics with Socio Economic Status is 10.89. This shows 10.89 percent variance of the Achievement in Physics is attributable to the Socio Economic Status for the students of private schools.

The confidence interval of the correlation is (0.23, 0.43). This indicates that if the correlation between the same variable is worked out for the whole population it will lie between 0.23 and 0.43 at 0.99 probability.

5. Achievement in Physics and Parental Support for the Students in Government Schools

r = 0.12

r^2 x 100 = 1.44

CI 0.99 = (0.01, 0.23)

The coefficient of correlation between Achievement in Physics and Parental Support for the students of government schools is 0.12, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as negligible.

The value of r is positive indicating further that any increase in the Parental Support will result in an increase in Achievement in Physics and vice versa for students of government schools.

The shared variance (percentage overlap) of Achievement in Physics with Parental Support is 1.44. This shows 1.44 percent variance of the Achievement in Physics is attributable to the Parental Support for the students of government schools.

The confidence interval of the correlation is (0.01, 0.23), indicating that if the correlation between the same variable is worked out for the whole population it will lie between 0.01 and 0.23 at 0.99 probability.

6. Achievement in Physics and Parental Support for Students in Private Schools

r = 0.32

r^2 x 100 = 10.24

CI 0.99 = (0.22, 0.42)

The coefficient of correlation between Achievement in Physics and Parental Support for the students of private schools is 0.32, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as low.

The value of r is positive indicating further that any increase in the Parental Support will result in an increase in Achievement in Physics and vice versa for students of private schools.

The shared variance (percentage overlap) of Achievement in Physics with Parental Support is 10.24. This shows 10.24 percent variance of the Achievement in Physics is attributable to the Parental Support for the students of private schools.

The confidence interval of the correlation is (0.22, 0.42) which indicates that if the correlation between the same variable is worked out for the whole population it will lie between 0.22 and 0.42 at 0.99 probability.

G. Relationship among the Achievement in Chemistry, Proficiency in English and Selected Contextual Factors for Management Category of Schools

The details of the relationships among the Achievement in Chemistry, Proficiency in English, Socio Economic Status and Parental Support, together

with confidence intervals and percentage of overlap obtained for Students of Government Schools and Students of Private Schools are presented in the following Table 30.

Table 30

Details of the Relationship among Achievement in Chemistry and Proficiency in English, Socio Economic Status and Parental Support for the Students of Government (N= 400) and Private (N= 600) Schools

Sl. No	Variable Compared	Sample	R	Percentage Overlap r^2 x 100	Confidence Interval		Level of Significance
					Lower limit	Upper limit	
1.	Achievement in Chemistry & Proficiency in English	Govt.	0.63	39.69	0.56	0.70	0.01
2.	Achievement in Chemistry & Proficiency in English	Private	0.68	46.24	0.62	0.74	0.01
3.	Achievement in Chemistry & Socio Economic Status	Govt.	0.27	7.29	0.16	0.38	0.01
4.	Achievement in Chemistry & Socio Economic Status	Private	0.34	11.56	0.24	0.44	0.01
5.	Achievement in Chemistry & Parental Support	Govt.	0.09	0.81	-0.03	0.21	0.01
6.	Achievement in Chemistry & Parental Support	Private	0.28	7.84	0.17	0.39	0.01

1. Achievement in Chemistry and Proficiency in English for the Students in Government Schools

r = 0.63

r^2 x 100 = 39.69

CI 0.99 = (0.56, 0.70)

The coefficient of correlation between Achievement in Chemistry and Proficiency in English for the students of government schools is 0.63, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as substantial or marked.

The value of r is positive indicating further that any increase in the Proficiency in English will result in an increase in Achievement in Chemistry and vice versa for the students of government schools.

The shared variance (percentage overlap) of Achievement in Chemistry with Proficiency in English is 39.69. This shows 39.69 percent variance of the Achievement in Chemistry is attributable to Proficiency in English for students of government schools.

The confidence interval of the correlation is (0.56, 0.70) which indicates that if the correlation between the same variable is worked out for the whole population it will lie between 0.56 and 0.70 at 0.99 probability.

2. Achievement in Chemistry and Proficiency in English for the Students in Private Schools

r = 0.68

r^2 x 100 = 46.24

CI 0.99 = (0.62, 0.74)

The coefficient of correlation between Achievement in Chemistry and Proficiency in English for the students of private schools is 0.68, which suggests

that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as substantial or marked.

The value of r is positive indicating further that any increase in the Proficiency in English will result in an increase in Achievement in Chemistry and vice versa for the students of private Schools.

The shared variance (percentage overlap) of Achievement in Chemistry with Proficiency in English is 46.24. This shows 46.24 percent variance of the Achievement in Chemistry is attributable to the Proficiency in English for the students of private Schools.

The confidence interval of the correlation is (0.62, 0.74) indicating that if the correlation between the same variable is worked out for the whole population it will lie between 0.62 and 0.74 at 0.99 probability.

3. Achievement in Chemistry and Socio Economic Status for the Students in Government Schools

r = 0.27

r^2 x 100 = 7.29

CI 0.99 = (0.16, 0.38)

The coefficient of correlation between Achievement in Chemistry and Socio Economic Status for the students of government schools is 0.27, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as low.

The value of r is positive indicating further that any increase in the Socio Economic Status will result in an increase in Achievement in Chemistry and vice versa for the students of government schools.

The shared variance (percentage overlap) of Achievement in Chemistry with Socio Economic Status is 7.29. This shows 7.29 percent variance of the Achievement in Chemistry is attributable to the Socio Economic Status for the students of government schools.

The confidence interval of the correlation is (0.16, 0.38) which indicates that if the correlation between the same variable is worked out for the whole population it will lie between 0.16 and 0.38 at 0.99 probability.

4. Achievement in Chemistry and Socio Economic Status for Students in Private Schools

$r = 0.34$

$r^2 \times 100 = 11.56$

CI 0.99 = (0.24, 0.44)

The coefficient of correlation between Achievement in Chemistry and Socio Economic Status for the students of private schools is 0.34, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as low.

The value of r is positive indicating further that any increase in Socio Economic Status will result in an increase in Achievement in Chemistry and vice versa for the students of private schools.

The shared variance (percentage overlap) of Achievement in Chemistry with Socio Economic Status is 11.56. This shows 11.56 percent variance of Achievement in Chemistry is attributable to the Socio Economic Status of students of private Schools.

The confidence interval of the correlation is (0.24, 0.44). This indicates that if the correlation between the same variable is worked out for the whole population it will lie between 0.24 and 0.44 at 0.99 probability.

5. Achievement in Chemistry and Parental Support for the Students in Government Schools

r = 0.09

r^2 x 100 = 0.81

CI 0.99 = (-0.03, 0.21)

The coefficient of correlation between Achievement in Chemistry and Parental Support for the students of government schools is 0.09, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as negligible.

The value of r is positive indicating further that any increase in the Parental Support will result in an increase in Achievement in Chemistry and vice versa for the students of government schools.

The shared variance (percentage overlap) of Achievement in Chemistry with Parental Support is 0.81. This shows 0.81 percent variance of the Achievement in Chemistry is attributable to the Parental Support for the students of government schools.

The confidence interval of the correlation is (-0.03, 0.21) which indicates that if the correlation between the same variable is worked out for the whole population it will lie between -0.03 and 0.21 at 0.99 probability.

6. Achievement in Chemistry and Parental Support for Students in Private Schools

r = 0.28

r^2 x 100 = 7.84

CI 0.99 = (0.17, 0.39)

The coefficient of correlation between Achievement in Chemistry and Parental Support for students of private schools is 0.28, which suggests that the relationship between these variables for the sample is real. The relationship can be verbally interpreted as negligible.

The value of r is positive indicating further that any increase in the Parental Support will result in an increase in Achievement in Chemistry for the students of private Schools.

The shared variance (percentage overlap) of Achievement in Chemistry with Parental Support is 7.84 This shows 7.84 percent variance of the Achievement in Chemistry is attributable to the Parental Support for the students of private Schools.

The confidence interval of the correlation is (0.17, 0.39). This indicates that if the correlation between the same variable is worked out for the whole population it will lie between 0.17 and 0.39 at 0.99 probability.

Discussion

The coefficient of correlation worked out revealed that the correlation among Achievement in Physics and proficiency in English, Socio Economic Status and Parental Support were found to be significant at 0.01 level for total sample,

and in all the subsamples based on gender (boys and girls), based on locale of the school (urban and rural) and type of management of the school (urban and rural). Again the coefficient of correlation among Achievement in Chemistry and proficiency in English, Socio Economic Status and Parental Support were also found to be significant at 0.01 level for total sample and for all the subsamples based on gender, locale and type of management. The obtained correlations, in all the cases, were positive indicating that for every increase in any of the independent variables there was a proportional increase in each of the dependent variable Achievement in Physics and Achievement in Chemistry (Achievement in Physical Science). The percentage overlap among these variables vary from 0.81 to 43.56. From these results it was clear that there existed a positive and significant relationship among Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) and the Independent Variables Proficiency in English, Socio Economic Status and Parental Support.

Comparison of Correlations

The correlation coefficient for two variables in one independent sample can be compared with the correlation coefficient for the same pair of variables in the other independent sample or samples. For comparison of correlations, whether the correlation coefficient for variable 1 and variable 2 in one of the samples is significantly different from the coefficient of correlation for the same pair of variables in the other sample or samples are tested. For testing the difference between two independent correlations, the correlations are transformed into corresponding Fisher's z values. Using this z values and size of the samples, the group difference in the two correlations was found out.

The result of the test of significance for difference between the correlations for relevant subsamples is presented in the following tables.

A. Gender Differences

Comparison of 'r' between the Independent and Dependent Variables of boys and girls was done by the test of significance of difference between 'r' s. The results are presented in Table 31.

Table 31

Details of the Test of Significance for Difference between Correlations for Subsample Boys and Girls (N=500)

Sl No	Variables Compared	Sample	r	z	t-value	Levels of Significance
1	Achievement in Physics & Proficiency in English	Boys	0.66	0.79	0.95	NS
		Girls	0.62	0.73		
2	Achievement in Physics & Socio Economic Status	Boys	0.28	0.29	0.16	NS
		Girls	0.27	0.28		
3	Achievement in Physics & Parental Support	Boys	0.26	0.27	2.05	0.05
		Girls	0.14	0.14		
4	Achievement in Chemistry & Proficiency in English	Boys	0.64	0.76	0.32	NS
		Girls	0.63	0.74		
5	Achievement in Chemistry & Socio Economic Status	Boys	0.32	0.33	0.32	NS
		Girls	0.30	0.31		
6	Achievement in Chemistry & Parental Support	Boys	0.19	0.19	0.79	NS
		Girls	0.14	0.14		

NS- Not Significant

Table 31 reveals that the t-value obtained for subsample based on gender (boys and girls) for the correlation between Proficiency in English and

Achievement in Physics is 0.95, which is less than the tabled value of 't' required for a significance at 0.05 level. Hence the relationship between Proficiency in English and Achievement in Physics is similar for both boys and girls.

From table 29 the t-value obtained for subsample boys and girls for the correlations between Socio Economic Status and Achievement in Physics is 0. 16 which is less than the 't' value required for a significance even at 0.05 level. Hence it is revealed that the relationship between Socio Economic Status and Achievement in Physics of boys is similar to that of girls.

The t-value obtained for subsample based on gender for the correlations between Parental Support and Achievement in Physics is 2.05, which is greater than the tabled value of 't' ($t > 1.96$) required for a significance at 0.05 level. Hence it can be concluded that there is significant difference in the correlation between Parental Support and Achievement in Physics for boys and girls.

Table 31 reveals that the t-value obtained for subsample based on gender for the correlation between Proficiency in English and Achievement in Chemistry is 0.32 Hence it is revealed that there is no significant difference in the relationship between Proficiency in English and Achievement in Chemistry for boys and girls.

From table 31 the t-value obtained for subsample boys and girls for the correlations between Socio Economic Status and Achievement in Chemistry is 0. 32 which is less than the 't' value required for a significance at 0.05 level. Hence it can be concluded that there is no significant difference in the relationship between Socio Economic Status and Achievement in Chemistry for boys and girls.

The t-value obtained for subsample based on gender for the correlations between Parental Support and Achievement in Chemistry is 0.79, which is less than the tabled value of 't' ($t < 1.96$) required for a significance at 0.05 level. Hence relationship between Parental Support and Achievement in Chemistry are almost the same for both boys and girls.

B. Differences between Rural-Urban Groups

Comparison of 'r' between the Independent and Dependent Variables of subsample Students of Urban Schools and Students of Rural Schools was done by the test of significance of difference between 'r' s. The results are presented in Table 32.

Table 32

Details of the Test of Significance for Difference between Correlations for Subsample Students of Urban and Rural Schools (N=500)

Sl. No.	Variables Compared	Sample	r	z	t-value	Levels of Significance
1	Achievement in Physics & Proficiency in English	Urban	0.63	0.74	-1.42	NS
		Rural	0.68	0.83		
2	Achievement in Physics & Socio Economic Status	Urban	0.24	0.24	-1.42	NS
		Rural	0.32	0.33		
3	Achievement in Physics & Parental Support	Urban	0.25	0.26	0.95	NS
		Rural	0.20	0.20		
4	Achievement in Chemistry & Proficiency in English	Urban	0.62	0.73	-2.21	0.05
		Rural	0.70	0.87		
5	Achievement in Chemistry & Socio Economic Status	Urban	0.27	0.28	-1.42	NS
		Rural	0.35	0.37		
6	Achievement in Chemistry & Parental Support	Urban	0.21	0.21	0.63	NS
		Rural	0.17	0.17		

Table 32 shows that the t-value obtained for subsample based on locale (Students of urban schools and students of rural schools) for the correlation between Proficiency in English and Achievement in Physics is -1.42 which is less than the tabled value of 't' required for a significance at 0.05 level. Hence there is no significant difference in the relationship between Proficiency in English and Achievement in Physics for Students of urban schools and students of rural schools

The t-value obtained from table 32, for the subsample, Students of urban schools and Rural Schools for the correlations between Socio Economic Status and Achievement in Physics is -1.42 which is less than the 't' value required for a significance at 0.05 level. So it can be concluded that the relationship between Socio Economic Status and Achievement in Physics for Students of urban schools and students of rural schools are almost the same.

The t-value obtained from table 32 for the correlations between Parental Support and Achievement in Physics is 0.95, which is less than the tabled value of 't' required for a significance at 0.05 level. Hence it is revealed that there is no significant difference in the relationship between Parental Support and Achievement in Physics for Students of urban schools and students of rural schools.

Table 32 reveals that the t-value obtained for subsample based on locale, for the correlation between Proficiency in English and Achievement in Chemistry is -2.21 which is greater than the tabled value of 't' required for a significance at 0.05 level. Hence it revealed that there is significant

difference in the relationship between Proficiency in English and Achievement in Chemistry for Students of urban schools and students of rural schools.

From table 32 the t-value obtained for subsample based on locale. For the correlation between Socio Economic Status and Achievement in Chemistry is -1.42 which is less than the 't' value required for a significance at 0.05 level. So it is revealed that there is no significant difference in the relationship between Socio Economic Status and Achievement in Chemistry for Students of urban schools and students of rural schools

Table 32 reveals that the t-value obtained for subsample Students of urban schools and Rural Schools for the correlations between Parental Support and Achievement in Chemistry is 0.63, which is less than the tabled value of 't' ($t < 1.96$) required for a significance at 0.05 level. So it can be concluded that there is no significant difference in relationship between Parental Support and Achievement in Chemistry for Students of urban schools and students of rural schools

C. Differences between Private -Government School Groups

Comparison of 'r' between the Independent and Dependent Variables of subsample Students of Government Schools and Students of Private Schools was done by the test of significance of difference between 'r' s. The results are presented in Table 33.

Table 33

Details of the Test of Significance for Difference between Correlations for Subsample Students of Government and Private Schools (N=500)

Sl No	Variables Compared	Sample	r	z	t-value	Levels of Significance
1	Achievement in Physics & Proficiency in English	Govt.	0.63	0.74	-1.42	NS
		Private	0.68	0.83		
2	Achievement in Physics & Socio Economic Status	Govt.	0.21	0.21	-2.04	0.05
		Private	0.33	0.34		
3	Achievement in Physics & Parental Support	Govt.	0.12	0.12	-3.31	0.01
		Private	0.32	0.33		
4	Achievement in Chemistry & Proficiency in English	Govt.	0.63	0.74	-1.42	NS
		Private	0.68	0.83		
5	Achievement in Chemistry & Socio Economic Status	Govt.	0.27	0.28	-1.10	NS
		Private	0.34	0.35		
6	Achievement in Chemistry & Parental Support	Govt.	0.09	0.09	-3.15	0.01
		Private	0.28	0.29		

The t-value obtained for subsample based on type of the management of the schools (government and private) the correlations between the Proficiency in English and Achievement in Physics is -1.42 which is less than the value of 't' required for a significance even at 0.05 level. Hence it is revealed that there is no significant difference in the relationship between the Proficiency in English and Achievement in Physics for the subsample students of government schools and students of private Schools.

The t-value obtained for subsample, Students of government schools and students of private schools for the correlations between Socio Economic Status and Achievement in Physics is - 2.04 which is greater than the 't' value required

for a significance at 0.05 level. Hence it is revealed that there is significant difference in the relationship between Socio Economic Status and Achievement in Physics for Students of government schools and students of private schools.

The critical ratio obtained for subsample, Students of government schools and students of private schools for the correlations between Parental Support and Achievement in Physics is - 3.31 which is greater than the 't' value required for a significance at 0.01 level. Hence it is revealed that there is significant difference in the relationship between Parental Support and Achievement in Physics for Students of government schools and students of private schools.

The t-value obtained for subsample based on type of the management of the schools (government and private) the correlations between Proficiency in English and Achievement in Chemistry is -1.42 which is less than the value of 't' required for a significance even at 0.05 level. So it can be concluded that there is no significant difference in the relationship between Proficiency in English and Achievement in Chemistry for the subsample based on type of management of the schools.

The t-value obtained for subsample, Students of government schools and students of private schools, for the correlations between Socio Economic Status and Achievement in Chemistry is -1.10 which is less than the 't' value required for a significance at 0.05 level. Hence it is revealed that the relationship between Socio Economic Status and Achievement in Chemistry is almost the same for Students of government schools and students of private schools.

The critical ratio obtained for subsample, Students of government schools and students of private schools for the correlations between and Parental Support

and Achievement in Chemistry is -3.15 which is greater than the 't' value required for a significance at 0.01 level. Hence it can be concluded that there is significant difference in the relationship between Parental Support and Achievement in Chemistry for Students of government schools and students of private schools.

Discussion

The results of the comparison of the Pearson's Product Moment correlations for difference in gender (boys and girls), difference in locale (urban and rural) and difference in type of management of the schools (government and private) were analysed. The analyses and interpretations of the result were as follows.

The comparison of correlation revealed that there is no significant difference in the relationship between Proficiency in English, Socio Economic Status and Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) for the subsample boys and girls. But there is significant difference in the relationship between Boys and Girls in their correlation between Parental Support and Achievement in Physics and the significance was at 0.05 level. It was also revealed that boys and girls show no significant difference in their relationship among Achievement in Chemistry and Proficiency in English, Socio Economic Status and Parental Support.

The critical ratio obtained for the correlations among Achievement in Physics and Proficiency in English, Socio Economic Status and Parental Support, for students of urban schools and students of rural schools found to be less than

1.96. Hence students of urban schools and students of rural schools showed almost the same correlations when their correlations in Proficiency in English, Socio Economic Status and Parental Support were compared with Achievement in Physics. The critical ratio obtained for the correlations among Achievement in Chemistry, Socio Economic Status and Parental Support, for students of urban schools and students of rural schools, are found to be less than 1.96. But the comparison of correlations between Achievement in Chemistry and Proficiency in English for students of urban schools and students of rural schools are found to be greater than the value required for significance at 0.05 level. Hence there is significant difference in the correlations between Achievement in Chemistry and Proficiency in English for students of urban schools and students of rural schools.

The critical ratio obtained for the subsamples, students of government schools and students of private schools, for the correlations between Proficiency in English and Achievement in Physics is less than the tabled value ($t < 1.96$) required for significance at 0.05 level. Hence there is no significant difference between the subsamples, students of government schools and students of private schools in their Proficiency in English and Achievement in Physics. The critical ratio obtained for students of government schools and students of private schools, for the correlations between Socio Economic Status and Achievement in Physics, is greater than the value required for significance at 0.05 level. Hence there is significant difference between students of government schools and students of private schools in their Socio Economic Status and Achievement in Physics. The critical ratio obtained for the subsamples, students of government

schools and students of private schools, for the correlations between Parental Support and Achievement in Physics, is greater than the value required for significance at 0.01 level. Hence there exists significant difference between students of government schools and students of private schools in their Parental Support and Achievement in Physics.

The critical ratio obtained for the subsamples, students of government schools and students of private schools, for the correlations among Proficiency in English, Socio Economic Status and Achievement in Chemistry are all less than the tabled value ($t < 1.96$) required for significance at 0.05 level. Hence there are no significant differences between the subsamples, students of government schools and students of private schools in their Proficiency in English, Socio Economic Status and Achievement in Chemistry. But the critical ratio obtained for the correlations between Parental Support and Achievement in Chemistry for subsamples students of government schools and students of private schools is 3.15 which is significant at 0.01 level. Hence it is revealed that the students of government schools and students of private school differ significantly in their Achievement in Chemistry and Parental Support.

Multiple Regression Analysis

Multiple regression analysis is used to find out the contribution of each of the independent variables to the dependent variable. By finding out the partial correlation coefficients regression equation can be constructed. This multiple linear regression equation can be used to estimate the contribution of the independent variables to the dependent variable and it can also be used to predict

the value of dependent variable for any of the variation in the independent variables. In the present study multiple regression analysis was carried out to frame linear regression equations to predict the contribution of Proficiency in English, Socio Economic Status and Parental Support on Achievement in Physical Science. The scores in Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry)for any variation in the scores of Proficiency in English, Socio Economic Status and Parental Support can be predicted using this linear regression equations. The assumptions regarding the data were checked before doing the multiple regression analysis. SPSS software was used to do all the drawings and calculations.

Assumption 1- Linearity

The first and most general assumption is regarding linearity. There should be a linear relationship between independent and dependent variables. In other words " the relationship between (the dependent variable) X and (independent variable) Y can be described by a straight line " (Garrett 2011). If scattered diagram has a curved shape or U - shape or with distinct breaks then the prediction using the multiple linear regression equation has little meaning. In order to check linearity scattered matrices were prepared for Achievement in Physics and Achievement in Chemistry separately. The shape of both the graphs plotted do not have a curved shape or U – shape but are almost tenting to linearity and hence accepted as linear. The graphs are presented in Figure No 6 and Figure 7 below.

Figure 6

Scattered Matrix to Test Linearity of Independent Variables Proficiency in English (PE), Socio Economic Status (SES), Parental Support (PS) and Dependent Variable Achievement in Physics (APHY) for Total Sample

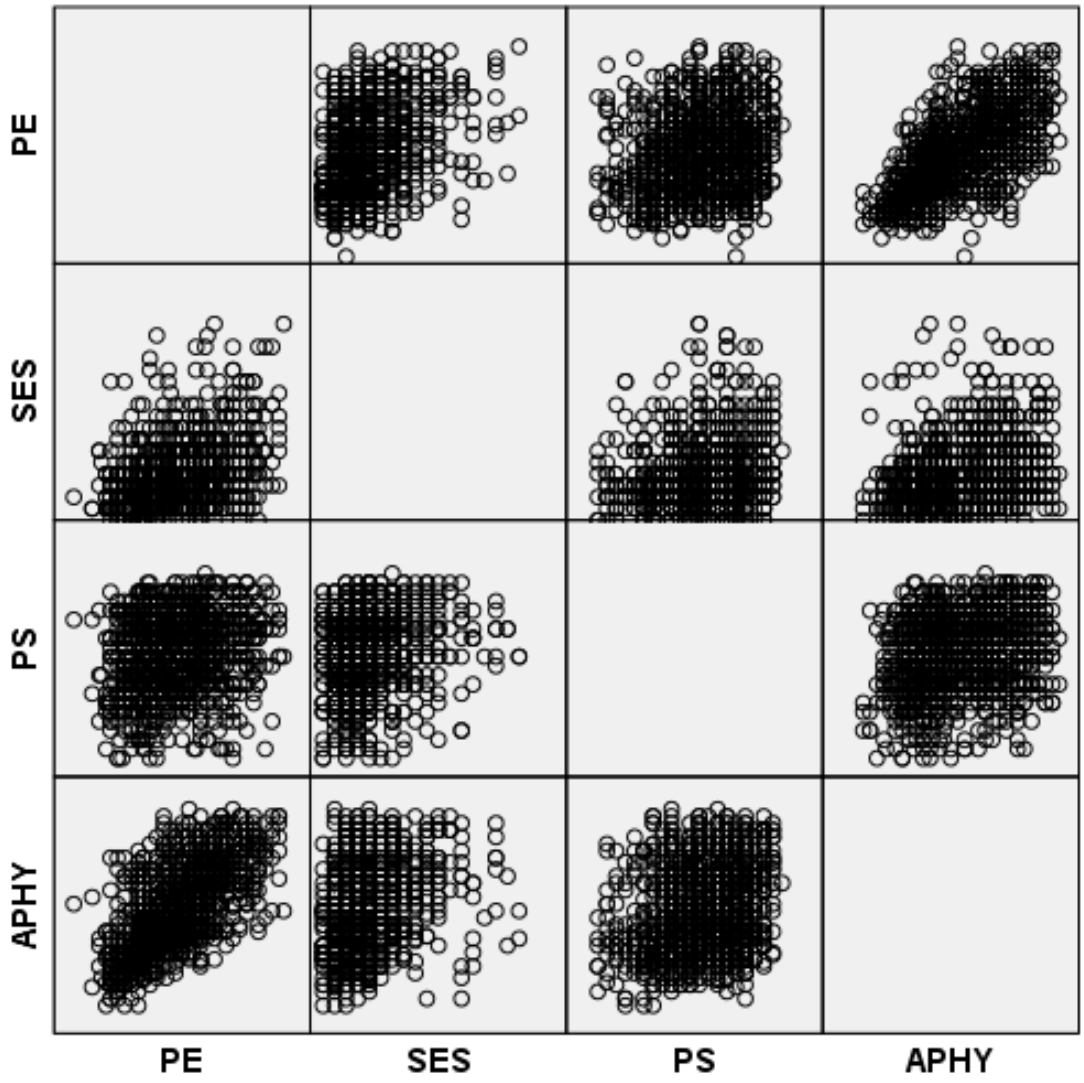
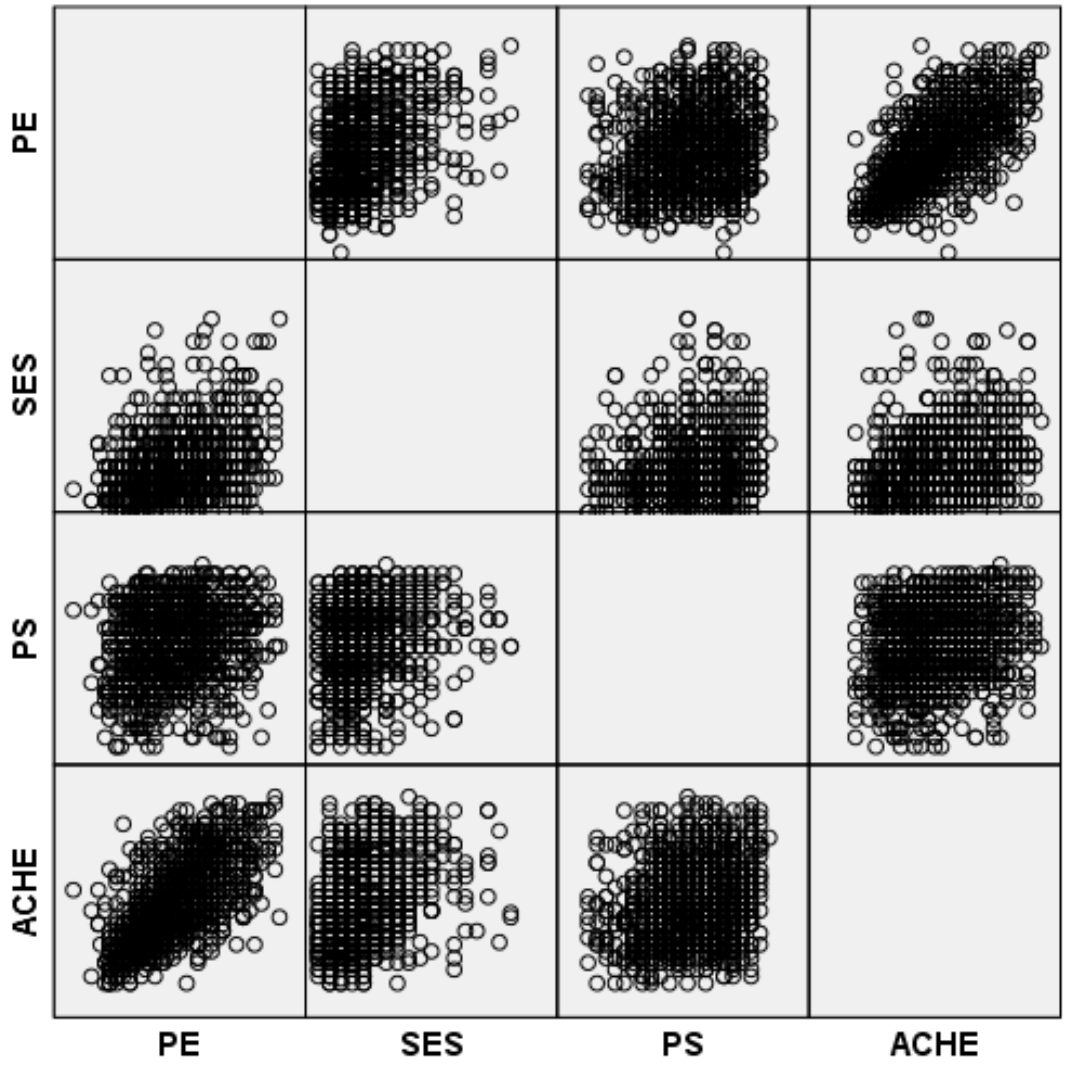


Figure 7

Scattered Matrix to Test Linearity of Independent Variables Proficiency in English (PE), Socio Economic Status (SES), Parental Support (PS) and Dependent Variable Achievement in Chemistry (ACHE) for Total Sample



Assumption 2 - Multicollinearity

There should be a difference among the independent variables to make an independent contribution in the dependent variable. For testing multicollinearity each of the independent variables were paired with all the other independent variables. The results of the collinearity tests are given in Tables 34, 35 and 36.

Table 34

Collinearity Statistics Table for Testing Collinearity between Independent Variables Socio Economic Status and Proficiency in English

Model		Collinearity Statistics	
		Tolerance	VIF
1	SES*	.875	1.142
	PE*	.875	1.142

SES* Socio Economic Status
PE* Proficiency in English

Table 35

Collinearity Statistics Table for Testing Collinearity between Independent Variables Socio Economic Status and Parental Support

Model		Collinearity Statistics	
		Tolerance	VIF
1	SES*	.973	1.028
	PS*	.973	1.028

SES* Socio Economic Status
PS* Parental Support

Table 36

Collinearity Statistics Table for Testing Collinearity between Independent Variables Parental Support and Proficiency in English

Model		Collinearity Statistics	
		Tolerance	VIF
1	PS*	.966	1.035
	PE*	.966	1.035

PS* Parental Support
PE* Proficiency in English

For multicollinearity the tabled value for tolerance should be higher than 0.2. In Tables 34, 35 and 36 all the values for tolerance are above 0.2. The variance inflation factor (VIF) below 3 is an ideal value. The tabled values for tolerance in

all the tables 34, 35 and 36 are not higher than 3. Hence it was concluded that there was no collinearity among the variable Proficiency in English (PE), Socio Economic Status (SES) and Parental Support (PS).

Assumption 3 -Homoscedasticity

Homoscedasticity indicates same scattering of scores of the variables about the same distance from the line of best fit in a scattered graph. It is to be confirmed that all the independent variables have the same impact on the dependent variable at all levels of the independent variables. For homoscedasticity in a given set of data, the ploted points in a scattered graph must be about the same distance from the regression line. Graphs for testing homoscedasticity for the variables are given in Figure-No 8 and Figure-No 9

Figure 8

Scattered Diagram to Test Homoscedasticity of Independent Variables Proficiency in English (PE), Socio Economic Status (SES), Parental Support (PS)and Dependent Variable Achievement in Physics (APHY) for Total Sample

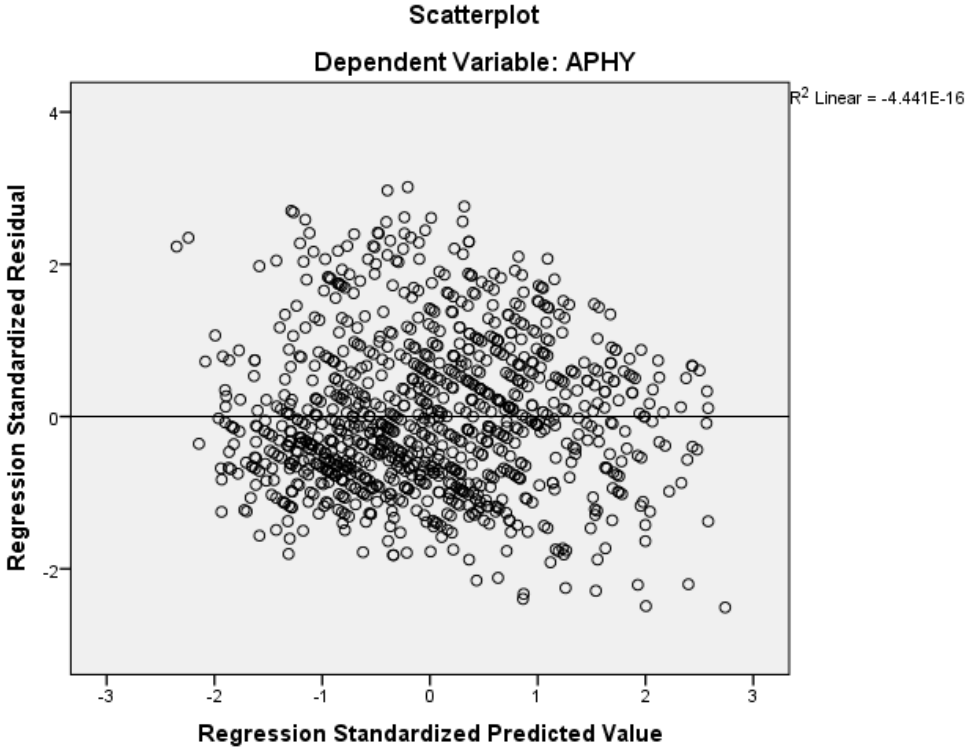
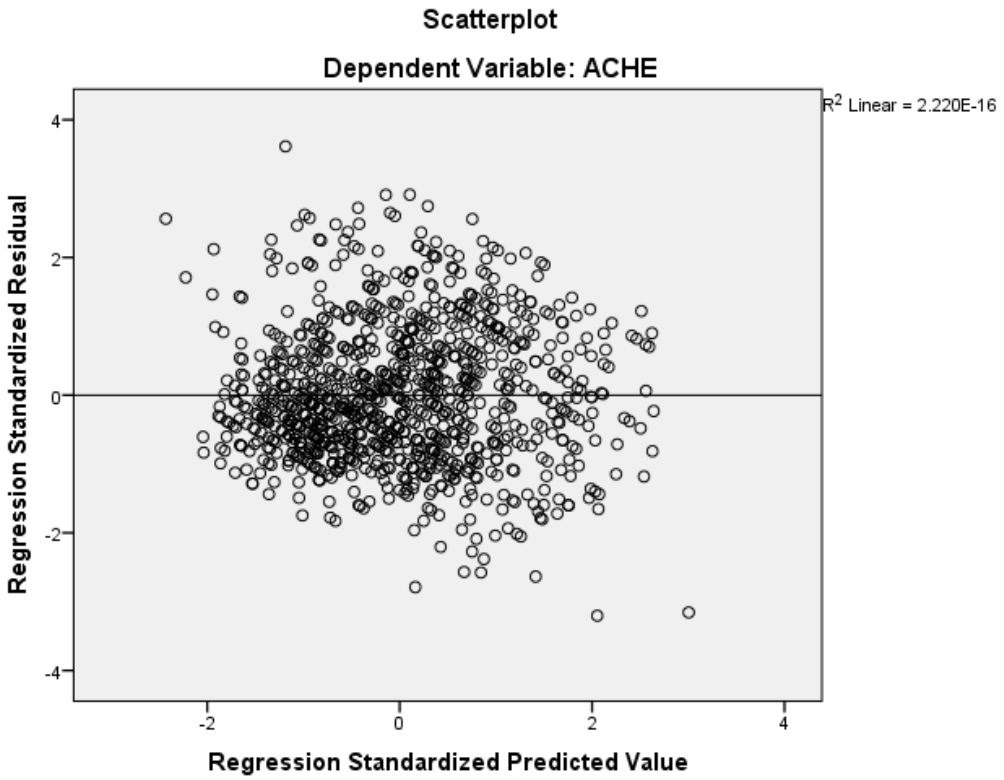


Figure 9

Scattered diagram to Check Homoscedasticity of Independent Variables Proficiency in English (PE), Socio Economic Status (SES), Parental Support (PS)and Dependent Variable Achievement in Chemistry(ACHE) for Total Sample



The graphs plotted to check homoscedasticity show that the scores of the variables are spread almost homogeneously about the line of best fit. Hence the data has been accepted as homoscedastic.

Assumption 4 -Independent Observation

The observations in a sample are independent from each other means that the measurements for each sample subject are in no way influenced by or related to the measurements of other subject or subjects. The results for checking independent observations are given in Table 37 and in Table 38.

Table 37 (a)

Table for checking Independent Observations for Variables Proficiency in English (PE), Socio Economic Status (SES), Parental Support (PS)and Dependent Variable Achievement in Physics(APHY) for Total Sample

R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
.665	.442	.441	14.131	1.671

Predictors: (Constant), Proficiency in English, Socio Economic Status and Parental Support
Dependent Variable: Achievement in Physics

For all the independent observations the Durbin- Watson value should be between 1.5 to 2. Here the table value for Durbin-Watson is 1.671. So all the observations using the tools of the variables are independent.

Table 37 (b)

Table for Testing Independent Observations for variables Proficiency in English (PE), Socio Economic Status (SES), Parental Support (PS)and Dependent Variable Achievement in Chemistry(ACHE) for Total Sample

R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
.665	.442	.440	13.452	1.823

Predictors: (Constant), Proficiency in English, Socio Economic Status and Parental Support
Dependent Variable: Achievement in Chemistry

The value obtained in Table 37(b) for Durbin-Watson is 1.82 and is less than 2 and greater than 1.5. Hence there is no autocorrelation among the variables tested. The data collected using the tools are independent.

As data collected was tested satisfactorily against the assumptions, the data was subjected to multiple regression analysis for constructing regression equations to predict the scores of Achievement in Physics and Achievement in

Chemistry from the scores of Independent Variables Proficiency in English, Socio Economic Status, and Parental Support. The details of the analysis are presented in Table 38 and Table 39.

Result of the multiple regression analysis is presented below:

For the present study Achievement in Physics and Achievement in Chemistry are the dependent variables and Proficiency in English and selected Contextual factors such as Socio Economic Status and Parental Support are considered as the independent variables for Multiple regression analysis

(1) For the Dependent Variable -Achievement in Physics

Multiple regression analysis for the dependent variable Achievement in Physics and the three independent variables Proficiency in English, Socio economic Status and Parental Support was carried out and the results are given in Table 38.

Table 38(a)

Multiple Regression Analysis - Model Summary of the Predictor Variables Proficiency in English (PE), Socio Economic Status (SES) and Parental Support (PS) on Dependent Variable Achievement in Physics for Total Sample

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics				
					R^2 Change	F Change	df_1	df_2	Sig. F Change
1	.665	.442	.441	14.131	.442	263.443	3	996	.000

Dependent Variable: Achievement in Physics

Predictors: (Constant), Proficiency in English, Socio Economic Status and Parental Support

Table 38(b)

Result of ANOVA in Multiple Regression of Predictors Proficiency in English (PE), Socio Economic Status (SES) and Parental Support (PS) on Dependent Variable Achievement in Physics for Total Sample

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	157811.328	3	52603.776	263.443	.000
Residual	198879.663	996	199.678		
Total	356690.991	999			

Dependent Variable: Achievement in Physics
Predictors: (Constant), Proficiency in English, Socio Economic Status and Parental Support

Table 38(c)

Coefficient of Multiple Regression Analysis of Predictor Variables Proficiency in English (PE), Socio Economic Status (SES) and Parental Support (PS) on Dependent Variable Achievement in Physics for Total Sample

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	b	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	7.725	2.736	- -	2.824	.005	2.357	13.094
PE	.679	.028	.621	24.323	.000	.624	.734
SES	.136	.085	.041	1.606	.109	-.030	.302
PS	.473	.107	.107	4.406	.000	.263	.684

Dependent Variable: Achievement in Physics
Predictors: (Constant), Proficiency in English, Socio Economic Status and Parental Support

The Table 38(a) is for "The model summary". The model summary table gives the value of coefficient of multiple correlation R which is equal to 0.665, the value of R^2 (coefficient of determination) is equal to 0.442. (R^2 x 100= 44.20). This means that 44.2 percent of the variations in the Achievement in Physics is

determined by the combined effect of Proficiency in English, Socio Economic Status and Parental Support. The standard error of estimation is 14.131.

Table 38 (b) is the ANOVA table. As there are total 4 variables and total number of sample is 1000, the degrees of freedom are 3 and 996, and the F value is 263.443 which is higher than the tabled value significant at 0.01 level

Table 38(c) is the table for coefficients. The value of constant is 7.725, the unstandardised coefficient of correlation for Proficiency in English (b_1), for Socio Economic Status (b_2) and for Parental Support (b_3) are 0.679, 0.136, and 0.473 respectively. The 't' value obtained for the variables proficiency in English, and for Parental Support are significant at 0.01 level. But the contribution of Socio Economic Status towards Achievement in Physics is not significant even at 0.05 level. Hence the contribution of Socio Economic Status towards Achievement in Physics is less than that of proficiency in English, and Parental Support.

The multiple regression equation for the prediction of the scores of Achievement in Physics from the scores of three independent variables in the score form is given by the equation

$Y= b_1X_1 + b_2X_2 + b_3X_3 + K$; (Y is the score of dependent variable and X_1, X_2, X_3 are the scores of independent variables). In the present case it can be written as

$Y = 0.679\ X_1 + 0.136\ X_2 + 0.473\ X_3 + 7.72$. ----------Equation 1

Where Y is the predicted score of the Achievement in Physics and X_1, X_2 and X_3 are the scores of Proficiency in English, Socio Economic Status, and Parental Support respectively.

In terms of standard scores the equation can be written as $Z= ß_1Z_1+ ß_2Z_2+ ß_3Z_3$. The table values for the beta coefficients $ß_1$, $ß_2$ and $ß_3$ are 0.621, 0.041 and 0.107 respectively. Hence the equation for the prediction of the scores of Achievement in Physics (Z) in terms of the corresponding standard scores for the three Independent Variables is given by the equation

$Z= 0.621\ Z_1+ 0.041\ Z_2 + 0.107\ Z_3$ ----------Equation 2.

(Z_1, Z_2 and, Z_3 are the standard scores of Proficiency in English, Socio Economic Status and Parental Support respectively).

Equation 1 and Equation 2 are the required multiple regression equations for the prediction of the scores of Achievement in Physics and for any variations in any of the scores of the Independent Variables Proficiency in English, Socio Economic Status and Parental Support.

2. For the Dependent Variable -Achievement in Chemistry

Multiple regression analysis for the three independent variables Proficiency in English, Socioeconomic Status and Parental Support and the dependent variable Achievement in Physics was carried out and the results are given in Table 39.

Table 39(a)

Multiple Regression Analysis - Model Summary of the Predictor Variables Proficiency in English (PE), Socio Economic Status (SES) and Parental Support (PS) on Dependent Variable Achievement in Chemistry for Total Sample

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics				
					R^2 Change	F Change	df_1	df_2	Sig. F Change
1	.665	.442	.440	13.452	.442	262.526	3	996	.000

Dependent Variable: Achievement in Chemistry
Predictors: (Constant), Proficiency in English, Socio Economic Status and Parental Support

Table 39(b)

Result of ANOVA in Multiple Regression of Predictors Proficiency in English (PE), Socio Economic Status (SES) and Parental Support (PS) on Dependent Variable Achievement in Chemistry for Total Sample

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	142520.122	3	47506.707	262.526	.000
Residual	180236.402	996	180.960		
Total	322756.524	999			

Dependent Variable: Achievement in Chemistry

Predictors: (Constant), Proficiency in English, Socio Economic Status and Parental Support

Table 39(c)

Coefficient of Multiple Regression Analysis of Predictor Variables Proficiency in English (PE), Socio Economic Status (SES) and Parental Support (PS) on Dependent Variable Achievement in Chemistry for Total Sample

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	b	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	8.791	2.604		3.376	.001	3.681	13.902
PE	.641	.027	.616	24.119	.000	.589	.693
SES	.255	.080	.081	3.171	.002	.097	.413
PS	.269	.102	.064	2.625	.009	.068	.469

Dependent Variable: Achievement in Chemistry

Predictors: (Constant), Proficiency in English, Socio Economic Status and Parental Support

The Table 39(a) is for "The model summary". The model summary table gives the value of coefficient of multiple correlation R which is equal to

0.665, the value of R^2 (coefficient of determination) is equal to 0.442. R^2 x 100= 44.20. This means that 44.2 percent of the variations in the Achievement in Chemistry is determined by the combined influence of Proficiency in English, Socio Economic Status and Parental Support. The standard error of estimate is 13.452.

Table 39 (b) is the ANOVA table. The number of total variables are 4 and total number of sample is 1000. Hence the degrees of freedom are 3 and 996, and the F value is 262.526 which is higher than the value required for significance at 0.01 level

Table 39(c) is the table for coefficients. 8.791 is the constant. The unstandardized coefficient of correlation for Proficiency in English (b_1), for Socio Economic Status (b_2) and for Parental Support (b_3) are 0.641, 0.255, and 0.269 respectively. The 't' value obtained for proficiency in English, Socio Economic Status and for Parental Support are significant at 0.01 level

The multiple regression equation for the prediction of the scores of Achievement in Chemistry from the scores of the three independent variables in the score form is given by the equation

$Y= b_1X_1 + b_2X_2 + b_3X_3 + K$; (Y is the score of dependent variable and X_1, X_2, X_3 are the scores of independent variables). In the present case it can be written as

$Y=0.641\ X_1+ 0.255\ X_2 + 0.269\ X_3 + 8.791$---------- Equation 1

In terms of standard scores the equation can be written as Z= ß1Z1+ $ß_2Z_2$+ $ß_3Z_3$. The table values for the beta coefficients ß1, ß2 and ß3 are 0.616, 0.081 and 0.064 respectively. Hence the equation for the prediction of the scores of Achievement in Chemistry in terms of the corresponding standard scores of the three independent variables is given by the equation

$Z= 0.616\ Z_1+ 0.081\ Z_2+ 0.064\ Z_3$ ---------- Equation 2.

(Z, Z_1, Z_2, and Z_3 are the standard scores of Achievement in Chemistry, Proficiency in English, Socio Economic Status and Parental Support respectively).

Equation 1 and Equation 2 are the required multiple regression equations for the prediction of the scores of Achievement in Chemistry from the scores of the Independent Variables Proficiency in English, Socio Economic Status and Parental Support.

Discussion

The multiple regression analysis revealed that the variables Proficiency in English, Socio Economic Status and Parental Support were capable to determine about 44 percent of the variability in both Achievement in Physics and Achievement in Chemistry. Among the Independent Variables Proficiency in English was more influential than Socio Economic Status and Parental Support and the least influential among the variables in determining the variability of Achievement in Physics and Achievement in Chemistry was Socio Economic Status. As the coefficients of multiple correlation and the

constants were all positive it can be concluded that, for any increase in the value of any of the independent variables there will be a corresponding increase in the variability of Achievement in Physics and Achievement in Chemistry and vice versa.

Chapter 5

SUMMARY, CONCLUSIONS AND SUGGESTIONS

- Study in Retrospect
- Objectives of the Study
- Hypotheses of the Study
- Procedure of the Study
- Important Findings
- Conclusions and Interpretations
- Tenability of the Hypotheses
- Educational Implications
- Suggestions for Further Research

SUMMARY, CONCLUSIONS AND SUGGESTIONS

The summary of the procedures, important findings of statistical analysis, tenability of hypotheses tested, interpretation and educational implications of the results are given in this chapter. Some suggestions for further research related to the findings of this study are also presented.

Study in Retrospect

The present investigation is entitled as "**Influence of Proficiency in English and Selected Contextual Factors on Achievement in Physical Science of Standard IX Students**".

Objectives of the Study

The objectives of the present study is designed to realize the following objectives:

1. To find out the mean scores of the Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) and Proficiency in English and the selected Contextual Factors (Socio-Economic Status and Parental Support) for total sample and the selected subsamples such as gender of students, locality and management category of schools.
2. To find out whether there exists any significant difference in the mean scores of the Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) and Proficiency in English and the selected Contextual Factors (Socio-Economic Status and Parental

Support) for the selected subsamples such as gender of students, locality and management category of schools.

3. To estimate the extent of relationship among Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) and Proficiency in English and the selected Contextual Factors (Socio-Economic Status and Parental Support) for total sample and the selected subsamples such as gender of students, locality and management category of schools.
4. To compare the relationship among Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) and Proficiency in English and the selected Contextual Factors (Socio-Economic Status and Parental Support) for the selected subsamples such as gender of students, locality and management category of schools.
5. To find out whether Achievement in Physical Science can be predicted from Proficiency in English and selected Contextual Factors (Socio-Economic Status and Parental Support)for the total sample.

Hypotheses of the Study

1. The mean scores of the Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) and Proficiency in English and the selected Contextual Factors (Socio-Economic Status and Parental Support) for total sample and the selected subsamples such as gender of students, locality and management category of schools will be different.
2. There will be significant difference in the mean scores of the Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) and Proficiency in English and the selected Contextual Factors

(Socio-Economic Status and Parental Support) for the selected subsamples such as gender of students, locality and management category of schools

3. There will be significant relationship among Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) and Proficiency in English and the selected Contextual Factors (Socio-Economic Status and Parental Support) for total sample and the selected subsamples such as gender of students, locality and management category of schools
4. There will be significant difference in the relationship among Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) and Proficiency in English and the selected Contextual Factors (Socio-Economic Status and Parental Support) for the selected subsamples such as gender of students, locality and management category of schools.
5. Achievement in Physical Science can be predicted from Proficiency in English and selected Contextual Factors (Socioeconomic Status and Parental Support) for the total sample.

Procedure of the Study

Design

For the present study survey method was used for collection of the data and quantitative techniques were used for analysis.

Sample

The study was conducted on a representative sample of 1000 students studying in standard IX, randomly from the schools situated in the Revenue

Districts of Kannur, Kozhikode, Malappuram, Palakkad, Thrissur, Ernakulam, Kottayam, Alappuzha, Kollam and Thiruvananthapuram in Kerala. Stratified random sampling technique was used, giving due representation to factors like gender, location of the schools (urban and rural) and type of school management (government and private).

Tools used for the Study

The investigator has used the following tools for the study.

1. Achievement Test in Physics for standard IX students (Gopalakrishnan & Naseema, 2018).
2. Achievement Test in Chemistry for standard IX students (Gopalakrishnan & Naseema, 2018).
3. ProficiencyTest in English for standard IX students (Gopalakrishnan & Naseema, 2018).
4. Socio-Economic Status Scale (Gopalakrishnan & Naseema, 2018).
5. Questionnaire on Parental Support (Gopalakrishnan & Naseema, 2018).

Statistical Techniques Used

Preliminary analysis to find out the important statistical constants such as mean, median, mode, standard deviation, skewness and kurtosis was carried out for the selected variables Proficiency in English and the Selected Contextual Factors (Socio Economic Status and Parental Support) and Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) for the total sample and the selected subsamples. Group difference in the five variables was found out from the mean and standard deviations of the relevant subgroups using test of significance of difference between means. The linear relationships among the five variables for the total sample and relevant subsamples were found

using correlation analysis. The comparison of the coefficient of correlation for the subsamples based on gender, locale and type of management of the school was also done. Multiple regression analysis was carried out to find out regression equation to enable the prediction of the scores of Physical Science (Achievement in Physics and Achievement in Chemistry) from the predictor variables.

Important Findings

The major findings of the study are as follows.

Preliminary Analysis

The mean scores of Achievement in Physics, Achievement in Chemistry, Proficiency in English, Socio Economic Status Scale and Questionnaire on Parental Support for total sample and subsamples based on gender, locale and type of management of the schools are found. Among the total sample and subsample the mean scores obtained for girls are the highest in Achievement in Physics (58.49), Achievement in Chemistry (54.84), Proficiency in English (51.82) and Parental Support (23.94). The highest mean (18.30) in Socio Economic Status is for the Students of urban schools. Among the total sample and subsample the lowest mean scores are (49.50) for boys, (46.30) for boys, (44.77) for boys,(17.40) for students of rural schools and (22.75)for boys in Achievement in Physics, Achievement in Chemistry, Proficiency in English, Socio Economic Status and Parental Support respectively.

Test ofSignificance of Difference between Mean Scores

The significance of difference between the mean scores in Achievement in Physics, Achievement in Chemistry, Proficiency in English, Socio Economic Status and Parental Support for the subsample based on gender, locale and type of management of the school are tested using a two-tailed test of significance.

Table 38

Summary of the Test of Significance for the Difference between Mean Scores of the Selected Variables for Different Subsamples

Sl. No.	Variables Compared	Group Compared	Mean	Standard Deviation	Critical Ratio	Level of Significance
1	Achievement in Physics	Boy	49.50	18.73	-8.07	0.01
		Girl	58.49	17.99		
		Urban	53.87	18.97	-0.21	N.S
		Rural	54.12	18.84		
		Government	55.27	17.55	2.12	0.05
		Private	52.73	20.09		
2	Achievement in Chemistry	Boy	46.30	17.54	-7.99	0.01
		Girl	54.84	17.40		
		Urban	51.26	18.32	1.23	N.S
		Rural	49.89	17.62		
		Government	51.44	17.33	1.46	N.S
		Private	49.71	18.57		
3	Proficiency in English	Boy	44.77	17.06	-6.84	0.01
		Girl	51.82	16.79		
		Urban	48.69	16.69	0.73	N.S
		Rural	47.90	17.86		
		Government	50.97	17.02	4.92	0.01
		Private	45.61	17.14		
4	Socio Economic Status	Boy	17.57	5.48	-1.63	N.S
		Girl	18.13	5.87		
		Urban	18.30	5.90	2.44	0.05
		Rural	17.40	5.44		
		Government	18.29	5.60	2.40	0.05
		Private	17,41	5.74		
5	Parental Support	Boy	22.75	4.31	-4.48	0.01
		Girl	23.94	4.13		
		Urban	23.41	4.35	0.45	N.S
		Rural	23.28	4.17		
		Government	23.15	3.99	-1.52	N.S
		Private	23.54	4.50		

N.S- Not Significant

Test of Significance for the Difference between Mean Scores of the variables revealed that there is significant difference between boys and girls in their mean scores of Achievement in Physics and Achievement in Chemistry. The obtained value of critical ratios for Achievement in Physics and Achievement in Chemistry are -8.07, -7.99 respectively. Both the values are significant at 0.01 level indicating further that Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) of girls is higher than that of boys.

There exists no significant difference between students of urban schools and students of rural schools in their mean scores of Achievement in Physics and Achievement in Chemistry. The critical ratio obtained for Achievement in Physics and Achievement in Chemistry are-0.21, 1.23, ($P< 0.05$). Hence it is concluded that Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) for students of urban schools and students of rural schools are almost the same.

There exists significant difference in the mean scores between students of government schools and students of private schools in their Achievement in Physics. The critical ratio obtained for Achievement in Physics is 2.12 which is greater than the value required for 0.05 level of significance. So it is concluded that the students of government schools had higher Achievement in Physics than that of students of private schools. There is no significant difference in the mean scores between students of government schools and students of private schools in their Achievement in Chemistry. The critical ratio obtained for Achievement in Chemistry is 1.46 which is less than the value required for 0.05 level of

significance. So the students of government schools and students of private schools are almost the same in their Achievement in Chemistry.

There exists significant difference between boys and girls in their mean scores of Proficiency in English. The obtained value of critical ratio for Proficiency in English is -6.84 which is significant at 0.01 level (P> 0.01). This indicated further that Proficiency in English of girls is higher than that of boys. There is no significant difference between students of urban schools and students of rural schools in their mean scores of Proficiency in English. The critical ratio obtained for Proficiency in English is 0.73, which is less than the value set for significance at 0.05 level. Hence it is concluded that the students of urban schools and students of rural schools show almost the same Proficiency in English. There is significant difference between students of government schools and students of private schools in their mean scores of Proficiency in English. The obtained value of critical ratio for Proficiency in English is 4.92 which is significant at 0.01 level. This indicated further that students of government schools excel students of private schools in their Proficiency in English.

There is no significant difference between boys and girls in their mean scores of Socio Economic Status. The critical ratio obtained for Socio Economic Status is-1.63, which is less than the value for significance at 0.05 level. Hence it is revealed that the Socio Economic Status of boys and girls are almost the same. There is significant difference between students of urban schools and students of rural schools in their Socio Economic Status. The critical ratio obtained for Socio Economic Status is 2.44, which is greater than the value set for significance at 0.05 level. Hence it is revealed that the students of urban schools have higher Socio Economic Status than that of students of rural schools. There is significant

difference between students of government schools and students of private schools in their Socio Economic Status. The critical ratio obtained for Socio Economic Status is 2.40 which is greater than the value required for significance at 0.05 level. So it is concluded that the students of government schools had higher Socio Economic Status than that of students of private schools.

There exists significant difference between boys and girls in their Parental Support. The value of critical ratio for Parental Support is -4.48 which is significant at 0.01 level indicating further that Parental Support of girls is higher than that of boys.

There is no significant difference between students of urban schools and rural schools in their Parental Support. The critical ratio obtained for Parental Support is 0.45 which is less than the value required for significance at 0.05 level. This revealed that the students of the urban schools and students of the rural schools enjoyed almost the same parental support towards Physical Science learning. The findings of the study revealed that there exists no significant difference between students of government schools and students of private schools in their parental support. The critical ratio of Parental Support obtained for students of government schools and students of private schools is -1.52 which is less than the value for 0.05 level of significance. Hence it is concluded that the students of government schools and students of private schools get almost the same level of Parental Support.

The Correlation Analysis

The estimation of the extent of relationships among the variables were done. It is presented in Table 39.

Table 39

Summary of Data and Results of Relationship between Selected Variables for Total Sample and Relevant Subsamples

Sample	Variables Compared	r	r^2 *100	Confidence Interval		Level of Significance
				Lower limit	Higher limit	
Total	APHY vs PE	0.66	43.56	0.61	0.71	0.01
	APHY vs SES	0.28	7.84	0.21	0.36	0.01
	APHY vs PS	0.23	5.29	0.15	0.31	0.01
	ACHE vs PE	0.66	43.56	0.61	0.71	0.01
	ACHE vs SES	0.31	9.61	0.24	0.38	0.01
	ACHE vs PS	0.19	3.61	0.11	0.27	0.01
Boys	APHY vs PE	0.66	43.56	0.60	0.73	0.01
Girls	APHY vs PE	0.62	38.44	0.55	0.69	0.01
Boys	APHY vs SES	0.28	7.84	0.17	0.39	0.01
Girls	APHY vs SES	0.27	7.29	0.16	0.38	0.01
Boys	APHY vs PS	0.26	6.76	0.15	0.37	0.01
Girls	APHY vs PS	0.14	1.96	0.03	0.25	0.01
Boys	ACHE vs PE	0.64	40.96	0.57	0.71	0.01
Girls	ACHE vs PE	0.63	39.69	0.56	0.70	0.01
Boys	ACHE vs SES	0.32	10.24	0.22	0.42	0.01
Girls	ACHE vs SES	0.30	9.00	0.20	0.41	0.01
Boys	ACHE vs PS	0.19	3.61	0.08	0.30	0.01
Girls	ACHE vs PS	0.14	1.96	0.03	0.25	0.01
Urban	APHY vs PE	0.63	39.69	0.56	0.70	0.01
Rural	APHY vs PE	0.68	46.24	0.62	0.74	0.01
Urban	APHY vs SES	0.24	5.76	0.13	0.35	0.01
Rural	APHY vs SES	0.32	10.24	0.22	0.42	0.01
Urban	APHY vs PS	0.25	6.25	0.14	0.36	0.01
Rural	APHY vs PS	0.20	4.00	0.09	0.31	0.01

Sample	Variables Compared	r	r^2 *100	Confidence Interval		Level of Significance
				Lower limit	Higher limit	
Urban	ACHE vs PE	0.62	38.44	0.55	0.69	0.01
Rural	ACHE vs PE	0.70	49	0.64	0.76	0.01
Urban	ACHE vs SES	0.27	7.29	0.16	0.38	0.01
Rural	ACHE vs SES	0.35	12.25	0.25	0.45	0.01
Urban	ACHE vs PS	0.21	4.41	0.10	0.32	0.01
Rural	ACHE vs PS	0.17	2.89	0.06	0.28	0.01
Govt.	APHY vs PE	0.63	39.69	0.56	0.70	0.01
Private	APHY vs PE	0.68	46.24	0.62	0.74	0.01
Govt.	APHY vs SES	0.21	4.41	0.10	0.32	0.01
Private	APHY vs SES	0.33	10.89	0.23	0.43	0.01
Govt.	APHY vs PS	0.12	1.44	0.01	0.23	0.01
Private	APHY vs PS	0.32	10.24	0.22	0.42	0.01
Govt.	ACHE vs PE	0.63	39.69	0.56	0.70	0.01
Private	ACHE vs PE	0.68	46.24	0.62	0.74	0.01
Govt.	ACHE vs SES	0.27	7.29	0.16	0.38	0.01
Private	ACHE vs SES	0.34	11.56	0.24	0.44	0.01
Govt.	ACHE vs PS	0.09	0.81	-0.03	0.21	0.01
Private	ACHE vs PS	0.28	7.84	0.17	0.39	0.01

The correlation analysis between Physical Science (Achievement in Physics and Achievement in Chemistry) and the Independent Variables Proficiency in English, Socio Economic Status and Parental Support for the Total sample and subsamples boys and girls, students of urban and rural schools and students of government and private schools are done. The values of all the correlation coefficients obtained are significant at 0.01 level. All the correlation coefficients are positive indicating that any increase in the value of the

Independent Variable would result in a corresponding increase in the Achievement in Physics and Achievement in Chemistry and vice versa. The percentage overlap between the variables is found to vary from 0.81 percent to 49 percent and population value falls between -0.03 to 0.76 for total sample and subsamples.

Comparison of Correlations

The details of test of significance for difference between the correlations for relevant subsamples are presented in Table 40.

Table 40

Details of the Test of Significance for Difference between Correlations for Subsamples based on Gender, Management category and Locality

Sample	Variables	r	z	t-value	Levels of Significance
Boys	APHY vs PE	0.66	0.79	0.95	NS
Girls	APHY vs PE	0.62	0.73		
Boys	APHY vs SES	0.28	0.29	0.16	NS
Girls	APHY vs SES	0.27	0.28		
Boys	APHY vs PS	0.26	0.27	2.05	0.05
Girls	APHY vs PS	0.14	0.14		
Boys	ACHE vs PE	0.64	0.76	0.32	NS
Girls	ACHE vs PE	0.63	0.74		
Boys	ACHE vs SES	0.32	0.33	0.32	NS
Girls	ACHE vs SES	0.30	0.31		
Boys	ACHE vs PS	0.19	0.19	0.79	NS
Girls	ACHE vs PS	0.14	0.14		
Urban	APHY vs PE	0.63	0.74	-1.42	NS
Rural	APHY vs PE	0.68	0.83		

Sample	Variables	r	z	t-value	Levels of Significance
Urban	APHY vs SES	0.24	0.24	-1.42	NS
Rural	APHY vs SES	0.32	0.33		
Urban	APHY vs PS	0.25	0.26	0.95	NS
Rural	APHY vs PS	0.20	0.20		
Urban	ACHE vs PE	0.62	0.73	-2.21	0.05
Rural	ACHE vs PE	0.70	0.87		
Urban	ACHE vs SES	0.27	0.28	-1.42	NS
Rural	ACHE vs SES	0.35	0.37		
Urban	ACHE vs PS	0.21	0.21	0.63	NS
Rural	ACHE vs PS	0.17	0.17		
Govt	APHY vs PE	0.63	0.74	-1.42	NS
Private	APHY vs PE	0.68	0.83		
Govt	APHY vs SES	0.21	0.21	-2.04	0.05
Private	APHY vs SES	0.33	0.34		
Govt	APHY vs PS	0.12	0.12	-3.31	0.01
Private	APHY vs PS	0.32	0.33		
Govt	ACHE vs PE	0.63	0.74	-1.42	NS
Private	ACHE vs PE	0.68	0.83		
Govt	ACHE vs SES	0.27	0.28	-1.10	NS
Private	ACHE vs SES	0.34	0.35		
Govt	ACHE vs PS	0.09	0.09	-3.15	0.01
Private	ACHE vs PS	0.28	0.29		

NS- Not Significant

Table 40 revealed that the t-value obtained for subsample based on gender (boys and girls) for the correlation between Proficiency in English and Achievement in Physics, and between Socio Economic Status and Achievement in Physics are

less than the tabled value of 't' required for a significance at 0.05 level. Hence the relationship of both Proficiency in English and Achievement in Physics, and Socio Economic Status and Achievement in Physics are similar for both boys and girls. The t-value obtained for boys and girls for the correlations between Parental Support and Achievement in Physics is 2.05, which is greater than the tabled value of 't' ($t > 1.96$) required for a significance at 0.05 level.

Hence it is concluded that there is significant difference in the correlation between Parental Support and Achievement in Physics for boys and girls. The t-value obtained, for subsample based on gender for the correlation between Proficiency in English and Achievement in Chemistry, Socio Economic Status and Achievement in Chemistry and between Parental Support and Achievement in Chemistry, are all less than the tabled value of 't' ($t < 1.96$) required for a significance at 0.05 level. Hence relationship of Proficiency in English, Socio Economic Status and Parental Support with Achievement in Chemistry are almost the same for both boys and girls.

The t-values obtained for subsample based on locale (Students of urban schools and students of rural schools) for the correlations Proficiency in English, Socio Economic Status and Parental Support with Achievement in Physics are all less than the tabled value of 't' required for a significance at 0.05 level. Again the t-values obtained for students of urban schools and students of rural schools for the correlations Socio Economic Status and Parental Support with Achievement in Chemistry are less than the 't' value required for a significance at 0.05 level. But the t-values obtained for students of urban schools and students

of rural schools for the correlations Proficiency in English and Achievement in Chemistry is -2.21 which is greater than the tabled value of 't' required for a significance at 0.05 level. Hence it is revealed that there is significant difference in the correlations of Proficiency in English and Achievement in Chemistry for students of urban schools and rural schools. But there is no significant difference in the correlations of the Independent variables Socio Economic Status and Parental Support with Achievement in Chemistry for the subsample based on locale (students of urban schools and students of rural schools).

The t-value obtained for the correlations between the Proficiency in English and Achievement in Physics for the subsample Students of government schools and students of private schools based on type of the management of the schools is less than the value of 't' required for a significance even at 0.05 level. Hence it is revealed that there is no significant difference in the relationship between Proficiency in English and Achievement in Physics for Students of government schools and students of private schools. The t-value obtained for subsample, Students of government schools and students of private schools for the correlations between Socio Economic Status and Achievement in Physics and between Parental Support and Achievement in Physics are -2.04, -3.31 respectively. Since -2.04 is greater than the 't' value required for a significance at 0.05 level and -3.31 is greater than the 't' value required for a significance at 0.01 level it is revealed that there exists significant difference in the correlation of Socio Economic Status and Parental Support with Achievement in Physics for Students of government schools and students of private schools.

The t-value obtained for subsample based on type of management of the schools (government and private) for the correlations between the Proficiency in English and Achievement in Chemistry and for the correlations between Socio Economic Status and Achievement in Chemistry are less than the value of 't' required for a significance even at 0.05 level. So it is concluded that there is no significant difference in the relationship between Proficiency in English and Achievement in Chemistry and Socio Economic Status and Achievement in Chemistry for the subsample based on type of management of the school. The critical ratio obtained for Students of government schools and students of private schools for the correlations between and Parental Support and Achievement in Chemistry is -3.15 which is greater than the 't' value required for a significance at 0.01 level. Hence it is revealed that there is significant difference in the relationship between Parental Support and Achievement in Chemistry for Students of government schools and students of private schools.

Multiple Regression Analysis

Multiple regression analysis is carried out to frame linear regression equations for predicting the contributions of each of the Independent variables Proficiency in English, Socio Economic Status and Parental Support on Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry). The assumptions Linearity, Multicollinearity, Homoscedasticity and Independent Observation regarding the data are checked beforedoing the multiple regression analysis.

Multiple Regression Analysis

Dependent Variable Achievement in Chemistry

Table 41

Multiple Regression Analysis - Summary of the Predictor Variables Proficiency in English (PE), Socio Economic Status (SES) and Parental Support (PS) on Dependent Variable Achievement in Physics for Total Sample

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics				
					R^2 Change	F Change	df_1	df_2	Sig. F Change
1	.665	.442	.441	14.131	.442	263.443	3	996	.000

Dependent Variable: Achievement in Physics

Predictors: (Constant), Proficiency in English, Socio Economic Status and Parental Support

Table 42

Coefficient of Multiple Regression Analysis of Predictor Variables Proficiency in English (PE), Socio Economic Status (SES) and Parental Support (PS) on Dependent Variable Achievement in Physics for Total Sample

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	b	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	7.725	2.736	- -	2.824	.005	2.357	13.094
PE	.679	.028	.621	24.323	.000	.624	.734
SES	.136	.085	.041	1.606	.109	-.030	.302
PS	.473	.107	.107	4.406	.000	.263	.684

Dependent Variable: Achievement in Physics

Predictors: (Constant), Proficiency in English, Socio Economic Status and Parental Support

The value of the coefficient of multiple correlation R which is equal to 0.665 and the value of R^2 (coefficient of determination) is equal to 0.442.(R^2*100 = 44.20). This means that 44.2 percent of the variations in the dependent variable, Achievement in Physics, is determined by the combined effect of

Proficiency in English, Socio Economic Status and Parental Support. The standard error of estimation is 14. 131.

From Table 42, the value of constant was 7.725, the unstandardized regression coefficients (*b*) of the predictors: Proficiency in English, Socio Economic Status and the Parental Support are 0.679, 0.136, and 0.473 respectively. The 't' value obtained for the variables proficiency in English, and for Parental Support are significant at 0.01 level. The contribution of Socio Economic Status towards Achievement in Physics is not significant at 0.05 level. Hence the contribution of Socio Economic Status towards Achievement in Physics is less than that of proficiency in English and that of Parental Support.

The multiple regression equation for the prediction of the scores of Achievement in Physics from the scores of three independent variables in the score form is given by the equation

$Y= b_1X_1 + b_2X_2 + b_3X_3 + K$; (Y is the score of dependent variable and X_1, X_2, X_3 are the scores of independent variables). In the present case it can be written as

$Y = 0.679X_1 + 0.136X_2 + 0.473X_3 + 7.725$…Equation 1

where Y is the predicted score of the Achievement in Physics and X_1, X_2 and X_3 are the scores of Proficiency in English, Socio Economic Status, and Parental Support respectively.

In terms of standard scores the equation can be written as $Z= ß_1Z_1+ ß_2Z_2+ ß_3Z_3$. The table values for the beta coefficients $ß_1, ß_2$ and $ß_3$ are 0.621, 0.041 and 0.107 respectively. Hence the equation for the prediction of the scores of Achievement in Physics (Z) in terms of the corresponding standard scores for the three Independent Variables is given by the equation

$Z= 0.621Z_1+ 0.041Z_2+ 0.107 Z_3$ ……..Equation 2

(Z_1,Z_2 and,Z_3 are the standard scores of Proficiency in English, Socio Economic Status and Parental Support respectively).

Equation 1 and Equation 2 are the multiple regression equations for predicting the scores of Achievement in Physics from the scores of the Independent Variables Proficiency in English, Socio Economic Status and Parental Support.

For Dependent Variable Achievement in Chemistry

Table 43

Multiple Regression Analysis - Summary of the Predictor Variables Proficiency in English (PE), Socio Economic Status (SES) and Parental Support (PS) on Dependent Variable Achievement in Chemistry for Total Sample

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics				
					R^2 Change	F Change	df_1	df_2	Sig. F Change
1	.665	.442	.440	13.452	.442	262.526	3	996	.000

Dependent Variable: Achievement in Chemistry

Table 44

Coefficient of Multiple Regression Analysis of Predictor Variables Proficiency in English (PE), Socio Economic Status (SES) and Parental Support (PS) on Dependent Variable Achievement in Chemistry for Total Sample

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	b	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	8.791	2.604	--	3.376	.001	3.681	13.902
PE	.641	.027	.616	24.119	.000	.589	.693
SES	.255	.080	.081	3.171	.002	.097	.413
PS	.269	.102	.064	2.625	.009	.068	.469

Dependent Variable: Achievement in Chemistry

Predictors: (Constant), Proficiency in English, Socio Economic Status and Parental Support

The model summary table 43 gives the value of coefficient of multiple correlation R which is equal to 0.665, the value of R^2 (coefficient of determination) is equal to 0.442. $R^2*100 = 44.20$. This means that 44.2 percent of the variations in the Achievement in Chemistry is determined by the combined influence of Proficiency in English, Socio Economic Status and Parental Support. The standard error of estimate is 13.452.

Table 44 gives the value of coefficients .8.791 is the constant. The unstandardised coefficient of correlation for Proficiency in English (b_1), the coefficient of correlation for Socio Economic Status ($b_{2)}$ and the coefficient correlation for Parental Support (b_3) are 0.641, 0.255, and 0.269 respectively. All the 't' values obtained for proficiency in English, Socio Economic Status and for Parental Support are significant at 0.01 level

The multiple regression equation for the prediction of the scores of Achievement in Chemistry from the scores of the three independent variables in the score form is given by the equation

$Y= 0.641X_1+ 0.255X_2+ 0.269X_3 +8.791$ ……. Equation 1

The table values for the beta coefficients $ß_{1,}$ $ß_2$ and $ß_3$ are 0.616, 0.081 and 0.064 respectively. The equation for the prediction of the scores of Achievement in Chemistry in terms of the corresponding standard scores is given by the equation

$Z= 0.616Z_1+ 0.081Z_2+ 0.064\ Z_3$ ……..Equation 2

Equation 1 and Equation 2 are multiple regression equations for the prediction of the scores of Achievement in Chemistry.

Conclusions and Interpretations

The study revealed that there exists difference in the mean scores obtained for Proficiency in English, Socio Economic Status, Parental Support, Achievement in Physics and Achievement in Chemistry for the total sample and the mean scores are 48.29, 17.85, 23.34, 54.00, and 50.57 respectively. The mean scores obtained for girls in Achievement in Physics, Achievement in Chemistry, Proficiency in English, and Parental Support are the maximum among all the subsamples. The mean scores obtained for Socio Economic Status Scale by students of urban schools is 18.30 which is the maximum score obtained for Socio Economic Status Scale among all the subsamples. The mean scores obtained for boys in Achievement in Physics, Achievement in Chemistry, Proficiency in English, and Parental Support are the minimum scores obtained among all the subsamples. The mean scores obtained for Socio Economic Status Scale by students of rural schools is 17.40 which is the minimum score obtained for Socio Economic Status Scale among all the subsamples

When the mean scores of the variables Achievement in Physics, Achievement in Chemistry, Proficiency in English, Socio Economic Status and Parental Support for the relevant subsamples based on gender, locale and type of management of the school are compared, it is found that there is significant difference between boys and girls in their Achievement in Physics, Achievement in Chemistry and Proficiency in English. Girls showed better Achievement in Physics, Achievement in Chemistry and Proficiency in English than that of boys. It is also seen that there is no significant difference between boys and girls when their Socio Economic Status is compared.

It was found that there is no significant difference between students of urban schools and students of rural schools when the mean scores of the variables Achievement in Physics, Achievement in Chemistry, Proficiency in English and Parental Support are compared. But the critical ratio obtained between students of urban schools and students of rural schools, for the variable Socio Economic Status, is significant at 0.05 level. Hence it is revealed that the Socio Economic Status of the students of urban schools are better than the Socio Economic Status of the students of the rural schools.

The critical ratios obtained between students of government schools and students of private schools for Achievement in Physics and proficiency in English are greater than the limit set for 0.05 and 0.01 level of significance respectively. This evidenced that Achievement in Physics and proficiency in English differ significantly between students of government schools and students of private schools. Students of government schools had better Achievement in Physics and proficiency in English than that of students of private schools. The critical ratio revealed that Achievement in Chemistry and Parental Support did not differ significantly between the students of government schools and students of private schools. The Critical ratio obtained for Socio Economic Status revealed that the Socio Economic Status of the students of government schools is higher than that of the students of private schools. This may be due to the fact that most of the government schools are situated in the urban areas.

The values of all the correlation coefficients obtained for the correlation among Independent Variables Proficiency in English, Socio Economic Status and Parental Support and dependent variables Achievement in Physics and

Achievement in Chemistry are significant at 0.01 level. All the correlation coefficients are positive indicating that any increase in the value of the Independent Variables would result in a corresponding increase in the Achievement in Physics and Achievement in Chemistry and vice versa.

The comparison of correlation revealed that there is no significant difference between boys and girls in their relationship between Proficiency in English and Achievement in Physics, between Socio Economic Status and Achievement in Physics, between Proficiency in English and Achievement in Chemistry, between Socio Economic Status and Achievement in Chemistry and between Parental Support and Achievement in Chemistry. But there is significant difference in the relationship between Boys and Girls in their correlation between Parental Support and Achievement in Physics.

The critical ratio obtained for students of urban schools and students of rural schools when their correlations among Achievement in Physics and Proficiency in English, Achievement in Physics and Socio Economic Status, Achievement in Physics and Parental support, Achievement in Chemistry and Socio Economic Status and Achievement in Chemistry and Parental Support are compared there is no significant difference between correlations for any of the pair of correlations compared. But critical ratio obtained for the comparison of correlations showed significant difference in the correlations between students of urban schools and students of rural schools for the variable Achievement in Chemistry and Proficiency in English. Hence it is revealed that though students of the urban schools showed more Proficiency in English than that of students of the rural schools the influence of Proficiency in English on Achievement in

Chemistry of students of the urban schools is less than that of students of the rural schools.

The critical ratio obtained between students of government schools and students of private schools, for the correlations between the variables Proficiency in English and Achievement in Physics, Proficiency in English and Achievement in Chemistry and between Socio Economic Status and Achievement in Chemistry showed that there is no significant difference in the correlation between the students of government schools and students of private schools among the variables compared. The critical ratio obtained for students of government schools and students of private schools, for the correlations among variables Socio Economic Status and Achievement in Physics, Parental Support and Achievement in Physics and Parental Support and Achievement in Chemistry showed significant difference in correlations. Hence it is revealed that the relationship of Socio Economic Status on Achievement in Physics and Parental Support on Achievement in Physics are greater for students of private schools than that for students of government schools. Again it is revealed that the influence of Parental Support on Achievement in Chemistry is greater for students of private schools than that for students of government schools.

Multiple Regression Analysis for Total Sample revealed that 44 percent of the Achievementin Physics and Achievement in Chemistry could be determined by the regression equations using the predictors Proficiency in English, Socio Economic Status and Parental Support. Among the Predictor Variables the most influential Predictor Variable is Proficiency in English and

the least influential is Socio Economic status. The coefficients of multiple correlation and the constants are all positive indicating that any increase in the value of any of the Predictor variables there is a corresponding increase in the variability in Achievement in Physics and Achievement in Chemistry vice versa.

Tenability of the Hypotheses

The tenability of the hypotheses are examined in the light of the above findings. The details are as follows:

1. The first hypothesis states that "The mean scores of the Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) and Proficiency in English and the Selected Contextual Factors (Socio Economic Status and Parental Support) for total sample and the selected subsamples such as gender of students, locality and management category of schools will be different".

   The result of the study showed that the mean scores obtained for Achievement in Physics for total sample is 54.00 and relevant subsamples boys and girls, students of urban schools and students of rural schools and students of government schools and students of private schools are 49.50, 58.49, 53.87, 54.12, 55.27 and 52.73 respectively. The mean scores obtained for Achievement in Chemistry for total sample is 50.57 and for relevant subsamples boys and girls, students of urban schools and students of rural schools and students of government schools and students of private schools are 46.30, 54.84, 51.26, 49.89, 51.44 and 49.71 respectively.

   The mean scores obtained for Proficiency in English for total sample is 48.29 and for subsamples boys and girls, students of urban schools and

students of rural schools and students of government schools and students of private schools are 44.77, 51.82, 48.69, 47.90, 50.97 and 45.61 respectively. The mean scores obtained for Socio Economic Status for total sample is 17.85 and for subsamples boys and girls, students of urban schools and students of rural schools and students of government schools and students of private schools are 17.57, 18.13, 18.30, 17.40, 18.29 and 17.41 respectively. The mean scores obtained for Parental Support for total sample is 23.34 and for relevant subsamples boys and girls, students of urban schools and students of rural schools and students of government schools and students of private schools are 22.75, 23.94, 23.41, 23.28, 23.15 and 23.54 respectively. So there exists difference in the mean scores of Achievement in Physics, Achievement in Chemistry, Proficiency in English, Socio Economic Status and Parental Support for the selected subsamples based on gender, locale and type of management of the school. So the first hypothesis is fully substantiated.

2. The second hypothesis states that "There will be significant difference in the mean scores of the Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) and Proficiency in English and the Selected Contextual Factors (Socio Economic Status and Parental Support) for the selected subsamples such as gender of students, locality and management category of schools"

The study revealed that there is significant difference between the mean scores of boys and girls in their Achievement in Physics, Achievement in Chemistry, Proficiency in English, and Parental Support. But there is no significant difference between the mean scores of boys and

girls in their Socio Economic Status. The study reveals that there is no significant difference between the mean scores of students of urban schools and students of rural schools in their Achievement in Physics, Achievement in Chemistry, Proficiency in English, and Parental Support. But there is significant difference between the mean scores of students of urban schools and students of rural schools in their Socio Economic Status. The study reveals that there is significant difference between the mean scores of students of government schools and students of private schools in their Achievement in Physics, Proficiency in English and Socio Economic Status. But there is no significant difference between the mean scores for students of urban schools and students of the rural schools in their Achievement in Chemistry and Parental Support. Hence the second hypothesis is partially substantiated.

3. The third hypothesis states that "There will be significant relationship among Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) and Proficiency in English and the Selected Contextual Factors (Socio Economic Status and Parental Support) for total sample and the selected subsamples such as gender of students, locality and management category of schools"

The study revealed that all the correlation coefficients, obtained for the relationship among Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) and Proficiency in English and the Selected Contextual Factors (Socio Economic Status and Parental Support) for the total sample and the selected subsamples such as gender of students,

locality and management category of schools are significant at 0.01 level of significance (P>0.01). Hence the third hypothesis is fully substantiated.

4. The fourth hypothesis states that "There will be significant difference in the relationship among Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) and Proficiency in English and the Selected Contextual Factors (Socio Economic Status and Parental Support) for the selected subsamples such as gender of students, locality and management category of schools"

The study revealed that there exists no significant difference in the relationship between Achievement in Physics and Proficiency in English, Achievement in Physics and Socio Economic Status, Achievement in Chemistry and Proficiency in English, Achievement in Chemistry and Socio Economic Status, Achievement in Chemistry and Parental Support for the subsample based on gender. But there exists significant difference in the relationship between Achievement in Physics and Parental Support, (P>0.05) for the subsample boys and girls.

The study revealed that there exists no significant difference in the relationship between Achievement in Physics and Proficiency in English, Achievement in Physics and Socio Economic Status, Achievement in Physics and Parental Support, Achievement in Chemistry and Socio Economic Status, Achievement in Chemistry and Parental Support for the subsample based on locale. But there exists significant difference in the relationship between Achievement in Chemistry and Proficiency in English (P>0.05), for students of urban schools and students of rural schools.

The study revealed that there exists no significant difference in the relationship between Achievement in Physics and Proficiency in English, Achievement in Chemistry and Proficiency in English and Achievement in Chemistry and Socio Economic Status for the subsample based on type of management of the school. But there exists significant difference in the relationship between Achievement in Physics and Socio Economic Status (P>0.05), Achievement in Physics and Parental Support (P>0.01), Achievement in Chemistry and Parental support (P>0.01), for the subsample students of government schools and students of private schools. Hence the fourth hypothesis is partially substantiated.

5. The fifth hypothesis states that "Achievement in Physical Science (Achievement in Physics and Achievement in chemistry) can be predicted from Proficiency in English and Selected Contextual Factors (Socio Economic Status and Parental Support) for the total sample".

The multiple regression analysis reveals that the variables Proficiency in English, Socio Economic Status and Parental Support are capable to predict about 44 percent of the variability in both Achievement in Physics and Achievement in Chemistry by the regression equation obtained. Among the Independent Variables Proficiency in English is more influential than Socio Economic Status and Parental Support and the least influential among the variables in determining the variability of Achievement in Physics and Achievement in Chemistry is Socio Economic status. So the fifth hypothesis is fully substantiated. The regression equation obtained exemplifies the identical nature of the subject Physics and Chemistry.

Educational Implications

The findings revealed that the better the Proficiency in English, Socio Economic Status and Parental Support the more the Achievement in Physics and Achievement in Chemistry and vice versa. For the all-round development of the child parental guidance, achievement in language, achievement in science and at least moderate social and economic status of the family are indispensable. Whatever may be the conceptions of human mind whether it is art, science, literature, or emotion, etc., there is no art to find it out but expressions through language and gestures are the only means to the end. The knowledge of any field including science cannot be induced or gained without the knowledge of the appropriate language of that particular faculty. The language of physics and chemistry are very much related.

Even within the subject Physics as it deals with different areas such as dynamics, mechanics, heat, etc. the appropriate terms united with the appropriate language varies purposely and meaningfully to a great extent. The language of Social Science, Law, Computer Science, Office Language etc do have its diversity along with the natural unity of the language. If one of the important purposes of school education is to make the one fit to live in the contemporary society we should be aware of the language prevalent in that contemporary society. English being a link language, an international language, a language for science and technology, the importance of English language is well accepted not only in India but in international level also. The present study showed that the higher the Proficiency in English of the students the more their Achievement in Physics and Achievement in Chemistry.

The correlation between Proficiency in English and Achievement in Physical Science (Achievement in Physics and Achievement in Chemistry) is more

significant than Socio Economic Status and Parental Support though all the correlations are in the positive direction. Hence parents and teachers should give ample opportunities for the child for the development of Proficiency in English so that it will be easier for the child to deal with various situations that the child may confront later. For the development of morale and values the language serves as an important means. That is why in the new two-year B.Ed. curriculum incorporated not only language of different disciplines but also given stress to the English language; which in turn will reach in the hands of future citizens. For the transaction of subject knowledge along with value education, do the teachers or parents work a lot as far as standard IX is concerned? No; "the best method of teaching', (by teacher, parent or any other formal or informal agency) 'is to make it clear that the subject is worth learning and to allow child's natural curiosity and interest in truth and understanding to mature and develop" (Chomsky).

As the education of the child is very much related to home environment parent's should provide their children with conducive home environment to bloom their abilities. For this parents, teachers, society, and government can also extend their help. Socio Economics status of the family plays an important role in providing a conducive environment and necessary materials to meet the educational needs of the child. Socio Economic level of the family is very much related to the educational needs. Educational needs have only little worth for a starving child. The responsibility of providing the necessary amenities to a student is not only incumbent on the shoulder of their parents but to the society, including teachers, and government. The study revealed that Parental Support is more related to Achievement in Physical Science than to Socio Economic Status as far as a standard IX student is concerned.

Parents should make effort to cater the needs of their children and should create an atmosphere of encouragement and approval at home and children should be appreciated for their success in all activities. Science subjects and English language should be given enough consideration and parents should make their children aware of the importance of each subject and the importance of the use of English language. Once the child feels that those subjects are worthy to be learned the responsibility of the parents is almost over and the rest is to provide the child with a conducive environment to learn.

In this matter teachers can also support their students. They should inculcate interest in their students to learn both English language and science subjects. Library books containing science fictions, literature books, science and mathematics reference books etc. should be provided at school. Teachers must occasionally evaluate the pupils achievement and give appropriate help and guidance to those who need special attention. Pupil should be provided with ample opportunities to take part in science and language clubs, fairs, exhibitions, seminars, symposiums, debates, quiz competitions and other extracurricular activities to develop students' individual abilities.

Resource persons and subject and language experts from DIET, SCERT, NCERT. Universities, and other educational agencies can be invited and their service may be utilized for teachers and students. Like other subjects, Physics and Chemistry are developing with 'rapid pace'. English language, due to the development in science and technology, also is not static. So to have an awareness of the contemporary and up to date knowledge of both subject and language, educational experts from universities may be invited to school and lectures, seminars, demonstrations and discussion, etc. can be arranged. Internet and computer facilities should be provided and utilized for enhancing personal capacities through language ability, subject knowledge, and computer skill.

It was our doubt that whether so much importance given to language education especially to English language, that we have effectively established through our present B.Ed. curriculum and school curriculum, would adversely affect the welfare of the individual, society and ultimately the progress of the nation which can be attained only through science education with the support of parents and conforming contextual factors related to the students concerned and hence this study. The result of the present study undoubtedly revealed that Proficiency in English and Selected Contextual Factors do have reasonable effect in the Achievement in Physics and Achievement in Chemistry (science subjects) in such a way so that as the Proficiency in English, Socio Economic Status and Parental Support increases there is a corresponding increase in the Achievement in Physics and Achievement in chemistry and vice versa.

Hence there is no need to ignore English language, thinking that it will hinder the progress in science education, on the contrary it is found that Proficiency in English and conducive home environment will boost the Achievements in science subjects while contributing values essential for a better social transformation.

Suggestions for Further Research

1. The present study can be extended to other disciplines like biology, mathematics, social science, history, business administration, etc.
2. Here in this study the influence of Proficiency in English has been taken into account. The influence of any regional language (eg. Malayalam, in Kerala), Hindi etc. can also be considered separately.
3. The present study was confined to Kerala State only. So a follow-up study may be conducted with a country wide sample.

4. The interaction effect of Proficiency in Languages (3 languages Malayalam English and Hindi or the three languages included in the school syllabus) on achievement in physics, chemistry and other subjects may be studied.
5. Among the contextual factors only the influence of homely factors were considered. Other factors like the influence of school, society, media etc can be studied.
6. All the data were collected from standard IX students only. Information from parents, teachers, head of the institutions, peers etc can be made use of for data collection using appropriate tools and techniques.
7. The present study can be conducted in special schools also.
8. The present study can be extended to other high school and higher secondary classes.

REFERENCES

REFERENCES

Abdulkader, P. (2000). *A study on the stress and professional efficiency of the heads of primary schools in Kerala* (Unpublished M.Ed. Dissertation). University of Calicut.

Abraham, M. (1974). *A study into some factors related to some under achievement in English of secondary school pupils* (Masteral Dissertation) University of Calicut.

Agarwal, K.L. (1986). A study of the effect of parental encouragement upon the educational development of the students. In M.B. Buch (Ed.), *Fourth Survey of Research in Education*. New Delhi: NCERT, 332.

Ali, M.M. (2007). *A study of psychological factors affecting the achievement in English Grammar at the secondary level* (Unpublished M.Ed. Dissertation). University of Calicut.

Arnold, M. (1966). *Culture and anarchy*. London: Cambridge Publication.

Ayodhyasingh, U.H. (2011). *Kabir vachanavali- Medieval poetry*. New Delhi: Vaniprakasan.

Banerjee *et al*. (1975). Relationship between motivational pattern and study habit of selected college students. *Manas, 22*, 205-218.

Baseve, D.T., & Christina, V. (1980). Child perceived parental behaviour related to achievement motivation in Mexican students. *Dissertation Abstracts International, 4343-A*.

Beevi, F.G.M. (2012). *Effectiveness of co-operative learning method on achievement in mathematics among high school students* (Unpublished M.Ed. Dissertation). Department of Education, University of Calicut.

Beryl, G.H. (1981). Parental involvement and chlldren's mathematics achievement. *Dissertation Abstracts International, 5059-A*.

Best, J.W., & Kan, J.V. (1995). *Research in education (7th ed.)*. New Delhi: Prentice Hall of India.

Beyessa, F. (2014). Major factors that affect grade 10 students' academic achievement in science education at Ilu Ababora General Secondary of Oromia Regional State, Ethi. *International Letters of Social and Humanistic Sciences, 21,* 118-134.

Bisht. (1987). A study of educational aspirations in relation to socio economic status. *Journal of the Institute of Educational Research*, Madras, 2(1).

Bloom, B.S. (1970). *Taxonomy of educational objectives handbook-I- cognitive domain*. London: Longman Group Ltd.

Bruner, J.S. (1962). *The process of education*. Cambridge: Harward University Press.

Chopra, S.L. (1982). A study of some non intellectual correlates of academic achievement. In M.B. Buch (Ed.), *Third Survey of Research in Education*. New Delhi: NCERT, 660.

Comber, L.C., & John, P.K. (1972). Science education in nineteen centuries. New York: A Halsted Press Book, 140-141.

Constantine, S.M. (1978). Expressed parental attitude towards child rearing-in relation to study habits, study attitudes and study skills, achievement in adolescents. Dissertation Abstracts International, 7253-A.

Dhami, G.S. (1974). Intelligence, emotional maturity and socio-economic status as factors indicative of success in scholastic achievement. In M.B. Buch (Ed.), *Third Survey of Research in Education*. New Delhi: NCERT, 961.

Dwivedi, R.D. (2005). Influence of school environment and approval motive on academic achievement of students. *Ram-Eesh Journal of Education, 2*(2), 101-107.

Eliot, T.S. (1921). *The sacred wood; essays on poetry and criticism*. New York: Alfred A. Knopf.

Engin, G. (2020). An examination of primary school students' academic achievements and motivation in terms of parents' attitudes, teacher motivation, teacher self-efficacy and leadership approach. *International Journal of Progressive Education*, *16* (1).

Ferguson, G.A. (1976). *Statistical analysis in psychology and education*. Tokyo: Mc Graw Hill.

Finlayson, D.S. (1971). Parental aspirations and educational achievement of children. *The Journal of Educational Research, 14*. 61-64.

Gafoor, A.K. (2001). *Influence of some parental variables on academic achievement of elementary school pupils* (Unpublished M.Ed. Dissertation). University of Calicut.

Gagne, R.M. (1970). The conditions of learning. In M.H. Dembo (Ed.), *Teaching for learning: applying educational psychology in the classroom*. California: Goodyear Publishing Co. Inc.

Garrett, H.E. (1979). *Statistics in psychology and education*. Bombay: Feffer and Simon Ltd.

Gayatridevi, P.R. (1985). A study to investigate parent's interest and its influence on children's academic achievement at middle school level in Bangalore university (Unpublished M.Ed. Dissertation). University of Mysore.

Good, C.V. (1973). *Dictionary of education (4th ed.)* New York: Mc Graw Hill Book Co.

Grover, S. (1979). Parental aspiration as related to personality and school achievements of children. In M.B. Buch (Ed.). *Fourth Survey of Research in Education*. New Delhi: NCERT, 823.

Guilford, J.P., & Fruchrer, B. (1978). *Fundamental statistics in psychology and education*. New York: McGraw Hill.

Helode, R.D., & Asha, A.T. (1988). Vocational choices and Family relationship. *Indian Journal of Community Guidance Service, 5*(1) 88.

Jean, F.B. (1979). A study of parental support for teacher's objectives and student's mathematics achievement. *Dissertation Abstracts International, 31*(9), 4548-A.

John, J. (2014). *Effectiveness of mastery of learning strategy on the achievement in physics among secondary school students* (Unpublished M.Ed. Dissertation). University of Calicut.

Jones, J.L. (1978). Parental factors affecting pupils' achievement. *Dissertation Abstracts International, 38*(12), 7198-A.

Khan, M.A. (1976). *Effect of parental deprivation on personality adjustment*. In M.B. Buch (Ed.), *Fourth Survey of Research in Education*. New Delhi: NCERT, 381.

Lalithamma, K.N. (1975). *Some factors affecting achievement of secondary school pupils in mathematics*. Unpublished Doctoral Dissertation, University of Kerala.

Lam, B.T., & Ducreux, E. (2013). Parental influence and academic achievement among middle school students: Parent perspective. *Journal of Human Behaviour in the Social Environment, 23* (5).

Manjusha, M.M. (2012). *A study on the relationship between problem solving ability and achievement in mathematics among secondary school students of Thrissur district* (Unpublished M.Ed. Dissertation). Department of Education, University of Calicut.

Martha, E.H. (1976). Parental attitude about mathematics education. *Dissertation Abstracts International, 37*(7), 4196-A.. `

Menon, S.K. (1972). A comparative study of personality characteristics of over-achievers and under-achievers of high ability. In M.B. Buch (Ed.), *Third Survey of Research in Education*. New Delhi: NCERT, 674.

Mercy, R. (2005). *Constraints in the education of the tribal pupils of Kerala* (Unpublished M.Ed. Dissertation). University of Calicut.

Mincy, K. (2014). *Relationship between attitude towards e-learning and academic achievement among higher secondary commerce students of Kozhikode district* (Unpublished M.Ed. Dissertation). University of Calicut.

Mini, N. (2018). *Influence of integrated instruction on attitude toward physics and achievement in physics among higher secondary students of Kerala* (Ph.D. Thesis). Department of Education, University of Calicut.

Mohamed, T.K. (1983). *A diagnostic study of errors in written English of pre-degree students* (Ph.D. Thesis). University of Calicut.

Mohanty, A.K. (2002). Gifted underachievers' perception of family environment. *Journal of All India Association for Educational Research, 14*(3 & 4).

Muhamed, T.K. (1987). The effect of socio-economic status on achievement in English with reference to learners errors. *Experiments in Education*. Vidya Publishing House.

Nasimudheen, T. (2016). *Effectiveness of socio-scientific issue based instruction on argumentation and achievement in Physics of Secondary school students*. Unpublished Ph.D. Thesis, Department of Education, University of Calicut.

Nehru, J. (1964). Spirit of` science. *In Kerala English Reader Standard 1X.* Dept. of education, Government of Kerala, Thiruvananthapuram.

Nirmaladevi, S. (1993). *The effect of certain social –familial variables on some representative convergent thinking and divergent thinking abilities of secondary school pupils*. Ph.D. Thesis, University of Calicut.

Nisha, P.S. (2012). *Study on the role between meta cognitive ability and academic achievement in chemistry among higher secondary school students in Wynad district (Unpublished M.Ed. Dissertation).* Department of Education, University of Calicut.

Noushad, P.P. (2012). *Influence of intellectual styles student burnout and metacognition on successful influence of secondary school students.* Unpublished Ph.D. Thesis, Department of Education, University of Calicut.

Paramesh. (1973). *Study on creativity, intelligence and academic achievement* (Ph.D. Thesis). Calicut University.

Raina, M.K. (1968). *A study of some correlates of creativity in Indian students* (Ph.D. Thesis). Rajastan University.

Rajalakshmi. (1982). A statistical analysis of performance with secondary school leaving certificate examination. *Journal of Institute of Educational Research*, *6*, 14-19.

Ramesan, E.S. (2014). *Achievement motivation, attitude towards Malayalam and some social-familial variables differentiating between high-, and low-creative underachievers in Malayalam among Secondary School Pupils of Kerala* (Ph.D. Thesis). University of Calicut.

Ramya, K. (2014). *Effectiveness of multimedia package on achievement in physics and hearing impaired students at secondary level*. Unpublished M.Ed. Dissertation, University of Calicut.

Rani, U.P. (1996). *The creativity of high school pupils in learning the English language* (Ph.D. Thesis). University of Calicut.

Reshmy, J.S. (2012). A study on *relation between self concept and academic achievement in science among secondary school students in Malappuram district (Unpublished M.Ed. Dissertation)*. Department of Education, University of Calicut.

Roshni, M. (2014). *Effectiveness of collaborative learning and English language achievement at secondary level (Unpublished M.Ed. Dissertation)*. University of Calicut.

Sahu, L.P., & Sood, R. (2005). Impact of students' perception of their teachers' attitude towards them and its relationship with their self-perception and academic achievement. *Ram-Eesh Journal of Education, 2*(2), 53-57.

Salunke, R.B. (1979). A study of the home environment, socio-economic status and economic management in relation to the academic achievement of the first year college students of M.S. University. In M.B. Buch (Ed.), Third Survey of Research in Education. New Delhi: NCERT, 1005.

Sankaran Nair, C.K. (1984). *Factors related to unachievement in biology of social science students* (M.Ed. Dissertation). Department of Education, University of Calicut.

Saravanakumar, A.R., & Mohan, S. (2007). Enhancing students achievement in science through metacognitive orientation. *Experiments in Education, 35*, 15-22.

Sarkar, U. (1983). Contribution of some home factors on children's scholastic achievement. In M.B. Buch (Ed.), *Fourth Survey of Research in Education*. New Delhi: NCERT, 849.

Satyaprakash, C.V., & Patnaik, S.P. (2005). Effect of co-operative learning on achievement motivation and achievement in biology. *Journal of All India Association for Educational Research, 17*(1-2), 82-83.

Sindhu, I.S. (2005). A study of teachers' motivation, student adjustment and their academic achievement. *Ram-Eesh Journal of Education, 2*(2), 19-23.

Sivadasan, C.P. (1982). *Linguistic experimentation in contemporary Indian verse in English - A study in comparative stylistics* (Ph.D. Thesis). Calicut University.

Smitha, J.A. (1981). The relationship of attitudes towards parenting and the academic achievement of children in a small Ohio city. *Dissertation Abstracts International, 80*(6), 961-A.

Smokoska, L. (2020). *An investigation of parental involvement and student academic achievement in middle school* (Dissertation). Eastern Illinois University.

Sreeja, D. (2005). *Development of an instructional strategy based on Vygotsky's approach for teaching basic mathematical concepts at the primary level (Unpublished M.Ed. Dissertation)*. University of Calicut.

Srivastava, K.K. (1978). The effects of family anxieties on educational achievements of adolescent girl students of the district Basti. In M.B. Buch (Ed.), *Third Survey of Research in Education*. New Delhi: NCERT, 692.

Stoffelsma, L., & Spooren, W. (2019). The relationship between English reading proficiency and academic achievement of first-year science and mathematics students in a multilingual context. *International Journal of Science and Mathematics Education 17*, 905–922 (2019). https://doi.org/10.1007/s10763-018-9905-z.

Tucker, H.R. (1978). Parental influence in the development of achievement behavior in adolescence. *Dissertation Abstracts International, 39* (4), 295-A.

Ulloorinte Thiranjedutha Kavithakal (2000). *Premasangeetham*. Kottayam: DC Books.

UNESCO. (2019). Reading habits, socioeconomic conditions, occupational aspiration and academic achievement in Vietnamese junior high school students. *Sustainability*, *11*(18), 5113. https://doi.org/10.3390/su11185113

Vamadevappa, H.V. (2005). Study of the effectiveness of parental involvement on academic achievement among higher primary students. *Journal of Educational Research and Extension, 42*(2), 23-32.

Venkataish, N.V. (1980). A study of achievement of students of different socio-economic status. *Journal of Educational Research*, 42-44.

Walberg, H.J., & Shanahan, T. (1983). High school effects on individual students. *Educational Researcher, 12*(7), 4-9.

Yadav, R.S. (1986). Correlation among IQ, age, academic achievement and parental income of high school science students. *Journal of Educational Research*, *4*, 12-17.

APPENDICES

Appendix I

UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

ACHIEVEMENT TEST IN PHYSICS

(For Standard IX Pupils)

(DRAFT)

Dr. C. NASEEMA
Professor of Education

Gopalakrishnan. P.P
M. Phil Student

Marks: 60

നിർദ്ദേശങ്ങൾ

തന്നിരിക്കുന്ന എല്ലാ ചോദ്യങ്ങൾക്കും A, B, C, D എന്നീ ഉത്തരങ്ങൾ കൊടുത്തിരിക്കുന്നു. ഇതിൽ ശരിയുത്തരം മനസ്സിലാക്കി പ്രത്യേകം തരുന്ന ഉത്തരക്കടലാസ്സിൽ ശരിയുത്തരത്തിന് നേരെയുള്ള ചതുരത്തിൽ 'X' എന്ന ചിഹ്നമിട്ട് രേഖപ്പെടുത്തുക.

1. ആക്കത്തിന്റെ യൂണിറ്റ് ഏത്?
   a. kg x ms b. kgm/s c. kg s/m d. sm/kg
2. 10 kg മാസുള്ള വസ്തുവിന്റെ പ്രവേഗം 10 m/s ൽ നിന്ന് 20 m/s ആയാൽ ആക്കവ്യത്യാസം എത്ര?
   a. 100kgm/s b. 100ms/kg c. 200kg x ms d. 200sm/kg
3. ആക്ക വ്യത്യാസത്തിന്റെ നിരക്ക് ഏത്?
   a. mu – mv b. mv-mu c. $\frac{mu - mv}{t}$ d mv-mu
4. 10kg മാസ് ഉള്ള വസ്തു നിശ്ചലാവസ്ഥയിൽ ആകുമ്പോൾ അതിന്റെ ആക്കം എത്ര?
   a. 10 b. 0 c. 1 d. 100
5. മണലിലേക്ക് ചാടുമ്പോൾ കാലിൽ ആഘാതം കുറയുന്നതിന് കാരണമെന്ത്?
   a. വേഗത കുറയുന്നു
   b ആക്കം കുറയുന്നു
   c ആക്ക വ്യത്യാസത്തിന്റെ നിരക്ക് കുറയുന്നു
   d ആക്ക വ്യത്യാസം കുറയുന്നു.
6. ബലത്തിന്റെ ആവേഗം കണക്കാക്കുന്നതെങ്ങിനെ?
   a. $\frac{f \times v}{t}$ b. $\frac{f \times u}{t}$ c . f x t d. $\frac{f}{t}$
7. ന്യൂട്ടന്റെ ഒന്നാംചലന നിയമം നിർവ്വചിക്കുന്നത് ഏതെല്ലാം?
   a. ബലം b ജഡത്വം c ബലവും ജഡത്വവും d ചലനം
8. F = kma എന്നത് ന്യൂട്ടന്റെ ഏത് നിയമവുമായാണ് ബന്ധപ്പെട്ടിരിക്കുന്നത്?
   a. ഒന്നാം ചലന നിയമം b. ഗുരുത്വാകർഷണ നിയമം
   c. രണ്ടാം ചലന നിയമം d. മൂന്നാം ചലന നിയമം

9. ബലത്തിന്റെ യൂണിറ്റ് ഏത്?

   a. N b Kg/s c Kg/ms d m/s

10. 10kg മാസുള്ള വസ്തുവിൽ 2s നേരത്തേക്ക് ബലം പ്രയോഗിക്കുന്നു. അതിന്റെ പ്രവേഗം നിശ്ചലാവസ്ഥയിൽ നിന്ന് 2 m/s ആയി വർദ്ധിച്ചാൽ പ്രയോഗിച്ച ബലം എത്ര?

    a. 10Kg b. 10 Kg/s c. 10 N d. 20 N

11. പാർക്കുകളിലെ റൈഡുകളിൽ വളരെ ഉയരത്തിൽ നിന്ന് അതിവേഗത്തിൽ താഴേക്ക് വരുന്ന കുട്ടികൾ അതേവേഗത്തിൽ തുടർന്ന് ഉയരങ്ങളിലേക്ക് പോകുന്നതിന്റെ ശാസ്ത്രതത്വം എന്ത്?

    a. ചലിക്കുന്ന വസ്തുവിന്റെ ജഡത്വം b. ഭൂമിയുടെ ആകർഷണ ബലം
    c. കാന്തിക വികർഷണബലം d. കുട്ടികളുടെ ഭാരം

12. റോക്കറ്റ് മുകളിലേക്കുയരുന്നത് ഏത് നിയമത്തിന്റെ അടിസ്ഥാനത്തിലാണ്?

    a. ഒന്നാം ചലന നിയമം b. ഗുരുത്വാകർഷണ നിയമം
    c. രണ്ടാം ചലന നിയമം d. മൂന്നാം ചലന നിയമം

13. പ്രവർത്തനവും പ്രതിപ്രവർത്തനവും തമ്മിലുള്ള ബന്ധമെന്ത്?

    a. രണ്ടും തുല്യമാണ് b. രണ്ടും തുല്യവും ഒരേ ദിശയിലുമാണ്
    c. രണ്ടും തുല്യവും വിപരീത ദിശയിലുമാണ് d. രണ്ടും വിപരീത ദിശയിലാണ്.

14. തോണിയിൽ നിന്ന് കരയിലേക്ക് ചാടുമ്പോൾ ചാടുന്നതിനാവശ്യമായ ബാഹ്യ ബലം എവിടെനിന്നാണ് ലഭിക്കുന്നത്?

    a. വെള്ളത്തിൽ നിന്ന് b. കരയിൽ നിന്ന്
    c. കാലുകളിൽ നിന്ന് d. വായുവിൽ നിന്ന്.

15. തോക്കിൽ നിന്ന് വെടിയുണ്ട പായുന്നതിൽ പ്രതിപ്രവർത്തനം ഏത്?

    a. ടിഗർ വലിക്കുന്നത് b. തോക്ക് ശബ്ദിക്കുന്നത്
    c. തോക്ക് പിൻപോട്ട് പോകുന്നത് d. തിര മുൻപോട്ട് പോകുന്നത്

16. തോണി തുഴയുമ്പോൾ പ്രവർത്തനം നടക്കുന്നതെവിടെ?

    a. വെള്ളത്തിൽ b. തോണിയിൽ c. വായുവിൽ d. കരയിൽ

17. പ്രവർത്തനവും പ്രതിപ്രവർത്തനവും പരസ്പരം ഇല്ലാതാക്കപ്പെടുന്നില്ല. കാരണമെന്ത്?

    a. രണ്ടും ഒരു വസ്തുവിലാണ് അനുഭവപ്പെടുന്നത്
    b. രണ്ടും ഒരു ബിന്ദുവിലാണ് അനുഭവപ്പെടുന്നത്
    c. രണ്ടും വ്യത്യസ്ത വസ്തുക്കളിലാണ് അനുുഭവപ്പെടുന്നത്
    d. രണ്ടും ഒരേ ദിശയിലാണ് അനുഭവപ്പെടുന്നത്.

18. രണ്ടു വസ്തുക്കൾ തമ്മിൽ കൂട്ടിയിടിക്കുമ്പോൾ രണ്ടു വസ്തുക്കളുടേയും ആദ്യ ആക്കവും അന്ത്യ ആക്കവും തമ്മിലുള്ള ബന്ധം എന്തായിരിക്കും.

    a. പൂജ്യമായിരിക്കും b. തുല്യമായിരിക്കും
    c. അന്ത്യ ആക്കം കൂടുതലായിരിക്കും d. അന്ത്യ ആക്കം കുറവായിരിക്കും.

19. ആക്ക സംരക്ഷണം നിയമം അനുസരിച്ച് ബാഹ്യബലമില്ലെങ്കിൽ ഒരു വ്യൂഹത്തിന്റെ ആകെ ആക്കം എങ്ങനെയിരിക്കും.

a. സ്ഥിരമായിരിക്കും
b. വ്യത്യാസപ്പെട്ടിരിക്കും
c. മാറിക്കൊണ്ടേയിരിക്കും
d. പൂജ്യമായിരിക്കും

20. m_1 മാസുള്ള വസ്തുവിന്റെ പ്രവേഗം u_1 ഉം m_2 മാസുള്ള വസ്തുവിന്റെ പ്രവേഗം u_2 ഉം ആണെങ്കിൽ അവയുടെ ആകെ ആക്കം എത്ര?.

a. $m_1 u_1$
b. $m_2 u_2$
c. $m_2 u_2 - m_1 u_1$
d. $m_1 u_1 + m_2 u_2$

21. ജലത്തിനുള്ളിൽ മുങ്ങിക്കിടക്കുന്ന ഒരു വസ്തുവിനെ ഉയർത്തുമ്പോൾ അതിന്റെ ഭാരം അനുഭവപ്പെടുന്നതെങ്ങിനെ?

a. കുറഞ്ഞതായി
b. കൂടിയതായി
c. കൂടിയും കുറഞ്ഞും
d. തുല്യമായി.

22. ഒരു വസ്തു ദ്രവത്തിൽ ഭാഗികമായോ, പൂർണ്ണമായോ മുങ്ങിയിരിക്കുമ്പോൾ ആ ദ്രവം വസ്തുവിൽ മുകളിലേക്ക് പ്രയോഗിക്കുന്ന ബലമാണ ്------?

a. പ്രതലബലം
b. പ്ലവക്ഷമബലം
c. ഇലാസ്തികബലം
d. ആകർഷണബലം

23. അലൂമിനിയ പാത്രം ജലത്തിൽ താഴ്ന്നു പോകാത്തതിന് കാരണം പാത്രം ആദേശം ചെയ്യുന്ന ജലത്തിന്റെ ഭാരം --- .

a. പാത്രത്തിന്റെ ഭാരത്തിനേക്കാൾ കൂടിയതുകൊണ്ട്
b. പാത്രത്തിന്റെ ഭാരത്തിനേ ക്കാൾ കൂറവായതുകൊണ്ട്
c. പാത്രത്തിന്റെ ഭാരത്തിന് തുല്യമായതുകൊണ്ട്
d. അലുമിനിയം ഭാരം കുറഞ്ഞ ലോഹമായതുകൊണ്ട്.

24. ജലത്തേക്കാൾ സാന്ദ്രത കുറഞ്ഞ ഒരു ദ്രാവകമാണ്----------?

a. തേൻ
b. മണ്ണെണ്ണ
c. രസം
d. ഉപ്പു വെള്ളം

25. ഒരു വസ്തു ജലത്തിൽ പൊങ്ങിക്കിടക്കുമ്പോൾ വസ്തുവിന്റെ ഭാരം വസ്തു ആദേശം ചെയ്യുന്ന ദ്രവത്തിന്റെ ഭാരവും തുല്യമായിരിക്കും. ഇതിന്റെ തത്വം ഏത്?

a. പ്ലവന തത്വം
b. ആർക്കമിഡീസ് തത്വം
c. കേശീകത്വം
d. പ്ലവക്ഷമബലം

26. ഒരു ദ്രാവകം വസ്തുവിൻമേൽ പ്രയോഗിക്കുന്ന ബലം വസ്തുവിന്റെ ------- ആശ്രയിച്ചിരിക്കുന്നു.

a. മാസിനെ
b. ഭാരത്തിനെ
c. വ്യാപ്തത്തിനെ
d. പ്രവേഗത്തിനെ

27. മണ്ണെണ്ണ ജലത്തിൽ പൊങ്ങിക്കിടക്കുന്നു. കാരണം മണ്ണെണ്ണയുടെ സാന്ദ്രത --- .

a. ജലത്തേക്കാൾ കൂടുതലാണ്
b. ജലത്തേക്കാൾ കുറവാണ്
c. ജലത്തിന് തുല്യമാണ്
d. ജലത്തേക്കാൾ കൂടുതലോ കുറവോ ആണ്.

28. ജലത്തിന്റെ സാന്ദ്രത ---------- ആകുന്നു.

a. $100kg/m^3$.
b. $100kg^{3/}m$
c. $1000kg/m^3$
d. $1000kg^3/m$

29. ആപേക്ഷിക സാന്ദ്രതയുടെ യൂണിറ്റ് ഏത്?

a. kg/m. b. m^2/kg c. kg^3/m^3 d. $\frac{kg/m^3}{kg/m^3}$

30. ദ്രാവകത്തിന്റെ ആപേക്ഷിക സാന്ദ്രത അളക്കാൻ ഉപയോഗിക്കുന്ന ഉപകരണമാണ് ----?

a. മീറ്റർ b. തെർമോമീറ്റർ c. കലോറിമീറ്റർ d. ഹൈഡ്രോമീററർ

31. ലാക്ടോമീറ്ററിന്റെ പ്രവർത്തനം ഏതുമായി ബന്ധപ്പെട്ടിരിക്കുന്നു?

a. പ്ലവനതത്വം b. ആർക്കമിഡീസ് തത്വം

c. ആകർഷണബലം d. ഗുരുത്വാകർഷണ ബലം

32. ഹൈഡ്രോളിക് ജാക് പ്രവർത്തിക്കുന്നത് ഏത് നിയമത്തിന്റെ അടിസ്ഥാനത്തിലാണ്?

a. പാസ്കൽ നിയമം b. ഗുരുത്വാകർഷണ നിയമം

c. ഒന്നാം ചലന നിയമം d. രണ്ടാം ചലന നിയമം

33. നേരിയ കുഴലിലൂടെ ദ്രാവകങ്ങൾ സ്വാഭാവികമായി ഉയരുകയോ താഴുകയോ ചെയ്യുന്ന പ്രതിഭാസമാണ് -------?

a. പ്ലവനം b. കേശീകത്വം c. ത്വരണം d. പ്ലവക്ഷമബലം

34. യൂണിറ്റ് പരപ്പളവിൽ അനുഭവപ്പെടുന്ന ബലത്തെ ------- എന്നു പറയുന്നു.

a. കേശീകത്വം b. ആകർഷണബലം c. വ്യാപ്തം d. മർദ്ദം

35. ദ്രാവകതുള്ളികൾ ഗോളാകൃതി പ്രാപിക്കുന്നതെന്തുകൊണ്ട്?

a. പ്ലവക്ഷമബലം b ദ്രവബലം c. പ്രതലബലം d. ആന്തരിക ബലം

36. ഒരേ ഇനം തന്മാത്രകൾ തമ്മിലുള്ള ആകർഷണ ബലമാണ് --------?

a. അഡ്ഹിഷൻ ബലം b. കൊഹിഷൻ ബലം

c. ഗുരുത്വാകർഷണബലം d. ഘർഷണ ബലം

37. കേശിക ഉയർച്ച ഉണ്ടാകുന്നതെന്തുകൊണ്ട്?

a. അഡ്ഹിഷൻ ബലം കൂടുതലാകുമ്പോൾ

b. കോഹിഷൻ ബലം കൂടുതലാകുമ്പോൾ

c. അഡ്ഹിഷൻ ബലം കൂറവാകുമ്പോൾ

d. അഡ്ഹിഷൻ ബലവും കോഹിഷൻ ബലവും സമമാകുമ്പോൾ

38. ട്യൂബിന്റെ വ്യാസം കൂടുമ്പോൾ കേശിക ഉയർച്ച കുറയാൻ കാരണം?

a. ട്യൂബിനകത്തെ ദ്രാവകത്തിന്റെ ഭാരം കുറയുന്നതിനാൽ

b. അഡ്ഹിഷൻ കൂടുതലാകുമ്പോൾ

c. കൊഹിഷൻ കൂടുന്നതിനാൽ

d. ട്യൂബിനകത്തെ ദ്രാവകത്തിന്റെ ഭാരം കൂടുന്നതിനാൽ

39. പറമ്പ് കിളച്ചിടുമ്പോൾ പറമ്പിലെ ജലാംശത്തിന് എന്ത് സംഭവിക്കുന്നു?

a. കേശിക ഉയർച്ച കൂടുന്നു. b. അഡ്ഹിഷൻ ബലം കൂടുന്നു

c. കോഹിഷൻ കൂടുന്നു. d. കേശിക ഉയർച്ച കുറയുന്നു.

40. വിസ്കബലം എന്നത് ഏത് തരം ബലമാണ്?

a. ഘർഷണ ബലം b. ഗുരുത്വാകർഷണബലം

c. അഡ്ഹിഷൻ ബലം d. പ്ലവക്ഷമബലം

41. വിസ്കോസിറ്റി കൂടുതൽ ഏതിന്?

a. ജലം b. തേൻ c. പെട്രോൾ d. ഉപ്പുവെള്ളം

42. ശരീരം തണുക്കുമ്പോൾ രക്തത്തിന്റെ വിസ്കോസിറ്റിക്ക് എന്ത് സംഭവിക്കുന്നു?

a. കൂടുന്നു b. കുറയുന്നു

c. കൂടുകയോ കുറയുകയോ ചെയ്യുന്നു d. ഒരു മാറ്റവും സംഭവിക്കുന്നില്ല.

43. കല്ലിന്റെ ഭാരം 100 N - ഉം, ജലത്തിൽ കല്ലിന്റെ ഭാരം 80N ഉം ആകുന്നു. ജലം കല്ലിൽ പ്രയോഗിച്ച പ്ലവക്ഷമബലം എത്ര?

a. 180 N b. 80 N c. 20 N d. 60 N

44. കല്ല് ജലത്തിൽ താഴ്ന്നുപോകുന്നതിന്റെ കാരണമെന്ത്?

a. പ്ലവക്ഷമബലം കൂടിയതിനാൽ b. പ്ലവക്ഷമബലം കുറഞ്ഞതിനാൽ

c. കല്ലിന് ഭാരം കൂടിയതിനാൽ d. ജലത്തിന് ഭാരം കുറഞ്ഞതിനാൽ

45. കപ്പൽ ജലത്തിൽ പൊങ്ങിക്കിടക്കുന്നു കാരണമെന്ത്? കപ്പൽ ആദേശം ചെയ്യുന്ന ജലത്തിന്റെ ഭാരം കപ്പലിന്റെ ----------

a. ഭാരത്തോടു തുല്യമായതിനാൽ b. ഭാരത്തേക്കാൾ കുറവായതിനാൽ

c. ഭാരവുമായി ബന്ധമില്ലാത്തതിനാൽ d. ഭാരത്തേക്കാൾ കൂടിയതിനാൽ

46. വായുവിലെ ഭാരം W1, ജലത്തിന്റെ ഭാരം W2, എന്നാൽ പ്ലവക്ഷമബലം എത്ര?

a. W1 + W2 b. W1 - W2 c. W1 x W2 d. W2 – W1

47. ദ്രാവകത്തിന്റെ സാന്ദ്രതക്കനുസരിച്ച് പ്ലവക്ഷമബലത്തിന് വരുന്ന മാറ്റമെന്ത്?

a. വ്യത്യാസപ്പെടുന്നു b. കൂടുന്നു c. കുറയുന്നു d. വ്യത്യാസപ്പെടുന്നില്ല.

48. ശുദ്ധജലം, ഉപ്പുവെള്ളം ഇവ ഒരോന്നിലും കല്ല് താഴ്ന്ന് പോകുന്നു. കാരണം

a. ശുദ്ധജലത്തിൽ പ്ലവക്ഷമബലം കൂടുതൽ

b. ഉപ്പുവെള്ളത്തിൽ പ്ലവക്ഷമബലം കൂടുതൽ

c. രണ്ടിലും പ്ലവക്ഷമബലം കുറവ്

d. രണ്ടിലും പ്ലവക്ഷമബലം കൂടുതൽ.

49. ശുദ്ധജലത്തിൽ തുല്യഭാരമുള്ള വസ്തുക്കൾക്ക് പ്ലവക്ഷമബലം

a. തുല്യമായിരിക്കും b. വ്യത്യസ്തമായിരിക്കും

c. വ്യത്യസ്തമോ തുല്യമോ ആയിരിക്കും d. രണ്ടിലും പ്ലവക്ഷമബലം കുടുതൽ.

50. ലോഹക്കഷ്ണങ്ങളുടെ ആകൃതി മാറുമ്പോൾ അതിന് എന്ത് സംഭവിക്കുന്നു?

a. മാസ് വ്യത്യാസപ്പെടുന്നു

b. ഭാരം വ്യത്യാസപ്പെടുന്നു

c. വ്യാപ്തം വ്യത്യാസപ്പെടുന്നു

d. മാസും ഭാരവും വ്യാപ്തവും വ്യത്യാസപ്പെടുന്നു.

51. ചലിച്ചുകൊണ്ടിരിക്കുന്ന വസ്തുക്കളുടെ വേഗവുമായി ബന്ധപ്പെട്ട് S എന്ന പ്രതീകം ഏതിനെ സൂചിപ്പിക്കുന്നു?

a. വേഗത b. ത്വരണം c. സ്ഥാനാന്തരം d. പ്രവേഗം

52. ത്വരണം =

a. $\frac{v-u}{t}$ b. $\frac{v+u}{t}$ c. $\frac{v+t}{u}$ d. $\frac{u+t}{v}$

53. 10 S സമയത്തിനുള്ളിൽ പ്രവേഗം 1 m/s ൽ നിന്ന് 11 m/s ആയി എങ്കിൽ അതിന്റെ ത്വരണം എത്ര?

a. 1 m/s^2 b. 10 m/s^2 c. 11 m/s^2 d. 12 m/s^2

54. ഒന്നാം ചലന സമവാക്യം ഏത്?

a. v+at= u b. u+at = v c. ut +a=v d. ua+t=v

55. സ്ഥാന-സമയ, വേഗ-സമയ, പ്രവേഗ-സമയ ഗ്രാഫിൽ Xഅക്ഷത്തിൽ

a. വേഗത b. സമയം c. സ്ഥാനം d. പ്രവേഗം

56. ഒരു കാർ നിശ്ചലാവസ്ഥയിൽ നിന്ന് ചലനം ആരംഭിച്ച് 5 sec കൊണ്ട് 100 m ദൂരം സമത്വരണത്തോടെ സഞ്ചരിക്കുന്നു. കാറിന്റെ ത്വരണം എത്ര?

a. 8 m/s^2 b. 10 m/s^2 c. 100 m/s^2 d. 5 m/s^2

57. ചലനം ഉണ്ടാക്കുന്ന ബലം ഏത്?

a. എല്ലാ ബലവും b. സന്തുലിത ബലം

c. അസന്തുലിത ബലം d. ആന്തരിക ബലം

58. ഒരു വസ്തുവിന് അതിന്റെ നിശ്ചലാവസ്ഥക്ക് സ്വയം മാറ്റം വരുത്തുവാനുള്ള കഴിവില്ലായ്മയാണ്

a. ചലന ജഡത്വം b. നിശ്ചല ജഡത്വം

c. നിശ്ചലാവസ്ഥ d. ചലനാവസ്ഥ

59. ആനയ്ക്ക് ഓട്ടത്തിനിടയിൽ പെട്ടെന്ന് ദിശമാറ്റാൻ കഴിയാത്തതിന് കാരണം

a. അതിന്റെ വലുപ്പം കൂടുതലാണ് b. അതിന്റെ ഭാരം കൂടുതലാണ്

c. ആനയ്ക്ക് വലിയ കാലുകളാണ് d. ആന വേഗത്തിൽ ഓടുന്നില്ല.

60. ആക്കം അളക്കുന്നതെങ്ങിനെ?

a. $\frac{m}{v}$ b. m x v c. $\frac{m^2}{v^2}$ d. $\frac{v}{m}$

Appendix II

UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

ACHIEVEMENT TEST IN PHYSICS

(For Standard IX Pupils)

(DRAFT)

Dr. C. NASEEMA
Professor of Education

Gopalakrishnan. P.P
M. Phil Student

Marks: 60

Instructions

Four choices is given for all the following questions. Select the correct answer. Mark X in the correct answer box in the separate answer sheet given.

1. What is the unit of momentum?
   a. kg x ms b. kgm/s c. kg s/m d. sm/kg
2. If the velocity of a body with mass 10kg changes from 10m/s to 20m/s.What will be the change in the momentum?
   a. 100kgm/s b. 100ms/kg c. 200kg x ms d. 200sm/kg
3. What is the rate of change of momentum?
   a. mu – mv b. mv-mu c. $\frac{mu - mv}{t}$ d mv-mu
4. What will be the momentum of a. body at rest if mass is 10 kg?
   a. 10 b. 0 c. 1 d. 100
5. Why is the impact less when we jump into sand?
   a. Speed decreases b. Momentum decreases
   c. Rate of change of momentum decreases d. change of momentum decreases.
6. How is the impulse of force is measured?
   a. $\frac{f \times v}{t}$ b. $\frac{f \times u}{t}$ c . f x t d. $\frac{f}{t}$
7. What does Newton's first law of motion define?
   a. Force b. Inertia c. Force and inertia d. Motion
8. To which law is F= kma. related?
   a. First law of motion b. Law of gravity
   c. Second law of motion d. Third law of motion
9. What is the unit of force?
   a. N b. kg/s c. kg/ms d. m/s

10. Force is applied for 2s to a. body with mass 10g .what will be the force applied if its velocity is increased to 2m/s from rest?

a. 10kg b. 10kg/s c. 10N d. 20N

11. What is the scientific. principle in the park riders in which children moving from top to bottom with high speed move upward with almost the same speed?

a. Inertia. of moving body b. Force of attraction of earth.

c. Magnetic. repulsion c. weight of children.

12. Which law is the basis of shooting up of rocket?

a. First law of motion b. Gravitional law

c. second law of motion d. Third law of motion

13. What is the relation between action and reaction?

a. Both are equal b. Both are equal and in same direction

c. Both are equal and in opposite direction d. Both are in opposite direction

14. From where do we get the essential external force to jump from boat to the shore?

a. From water b. From shore c. From legs d. From air

15. Which is the reaction when bullet is fired?

a. The pulling of trigger b. The sound of gun

c. Recoil of the gun d. The forward movement of bullet

16. Where does the action take place when boat is rowed?

a. on water b. on boat c. On air d. On ground

17. Action and reaction do not cancel each other why?

a. Both are exerted in one body b. Both are exerted in one point

c. Both are exerted in different body d. Both are exerted in one direction

18. If two objects collide each other what will be the relation between initial momemtum and final momentum?

a. Zero b. Equal

c. Final momentum is greater d. Final momentum is less.

19. What will be the total momentum of a. system in the absence of an external force according to law of conservation of momentum?

a. Constant b. Different c. Changing d. Zero

20. What will be the total momentum if the velocity of a. body with mass m_1 is u_1 and velocity of a body with mass m_2 is u_2?

a. $m_1 u_1$ b. $m_2 u_2$ c. $m_2 u_2$ -þ $m_1 u_1$ d. $m_1 u_1 + m_2 u_2$

21. How do we experience the weight when a. body immersed in water is lifted?

a. Decreased b. Increased c. Increased and decreased d. Equal

22. When a. body is immersed completely or partially in a. liquid the upward force exerted by the liquid on the body is

a. Surface tension b. Buoyancy

c. Elastic. force d. Force of attraction

23. Aluminium vessel does not sink in water because the weight of the water displaced is---------

a. Greater than the weight of the vessel

b. Less than the weight of the vessel

c. Equal to the weight of the vessel.

d. Weight of the aluminium metal is less

24. Liquid less denser than water is ----------?

a. Honey b. Kerosene c. Mercury d. Salt water.

25. Weight of a floating body is equal to the weight of the liquid displaced by it which is the law?

a. Law of floation b. Archimedes principle c. Capillary rise d. Buoyancy

26. The force that the liquid acts on a. floating body depends upon the --------- of the body .

A. Mass b. weight c. Volume d. velocity

27. Kerosene is floating on water because density of kerosene is ----------

a. Greater than water b. Less than water

c. Equal to water d. Either greater or less than water

28. The density of water is ---------

a. 100kg/m^3. b. 100$kg^{3/}$m c. 1000kg/m^3 d. 1000kg^3/m

29. What is the unit of relative density?

a. kg/m. b. m^2/kg c. kg^3/m^3 d. $\frac{kg/m^3}{kg/m^3}$

30. The equipment used for measuring the relative density is ---------

a. Meter b. Thermometer c. Calorimeter d. Hydrometer.

31. What is related to the working of lactometer?

a. Law of floation b. Archimedes principle

c. Attraction force d. Gravitational force.

32. What is the principle in the working of hydrolic jack?

a. Pascal's law b. Gravitational law

c. First law of motion d. Second law of motion.

33. The rise or depression of liquids in narrow tube is-------

a. Floatation b. capillarity c. Acceleration d. Buoyancy

34. Force acting on a. unit area is ----------

a. Cappillarity b. Attractive force c. Volume d. Pressure

35. Why do liquid drops take a spherical shape?

a. Buoyancy b. Force of liquid c. Surface tension d. Internal Force.

36. The attraction between same type of molecules is ----------

a. Adhesive force b. Cohesive force c. Gravitational force d. Frictional force.

37. Why does capppillary rise occur?

a. When adhesive force is greater b. Cohesive force is greater

b. Adhesive force is less d. Adhesive force and cohesion force are equal.

38. Why does capillary rise decrease when the diameter of the tube increase

a. The weight of the liquid inside the tube is decreasing

b. Adhesive force is increasing

c. cohesive force is increasing.

d. The weight of the liquid inside the tube is greater.

39. What happens to the water in the land when its surface is ploughed?

a. Capillary rise increases b. Adhesive force increases.

c. Cohesive force increases d. Capillary rise decreases.

40. What type of force is viscus force?

a. Frictional force b. Gravitational force c. Adhesive force d. Buoyancy.

41. For which viscosity is greater?

a. Water b. Honey c. petrol d. Salt water

42. What happened to the viscosity of blood when body temperature decreases?

a. Increases b. Decreases

c. Either increases or decreases d. No change occurs.

43. The weight of stone is 100N and the weight of stone in water is 80 N. What is the buoyancy that water acted on stone?

a. 180N b. 80N c. 20N d. 60N

44. Why does stone sink in water?

a. Buoyancy is greater b. Buoyancy is less

c. The weight of stone is greater d. The weight of water is less.

45. Why does ship float in water?. The weight of the displaced water is ----------

a. Equal to the weight of ship. b. Less than the weight of ship.

c. Not related to the weight of the ship d. Greater than the weight of the ship

46. Weight in air is W_1, the weight of the water is W_2, then what is buoyancy?

a. W1 + W2 b. W1 - W2 c. W1 x W2 d. W2 – W1

47. What happens to the buoyancy according to the density of the fluid?

a. Changes b. Increases c. Decreases d. Not changing

48. Stone sinks in pure water and in salt water. Why?

a. Buoyancy in pure water is greater b. Buoyancy in salt water is greater

c. Low buoyancy in both d. High buoyancy in both

49. The buoyancy of bodies in water with equal weight is ----------

a. Equal b. Different

c. Equal or different d. In both buoyancy is greater.

50. What happens when the shape of metal pieces change?

a. Mass change b. Weight change

c. Volume change d. Mass and weight change

51. What does S represent related to the speed of moving body?

a. Speed b. Acceleration c. Displacement d. Velocity

52. Acceleration=

a. $\frac{v-u}{t}$ b. $\frac{v+u}{t}$ c. $\frac{v+t}{u}$ d. $\frac{u+t}{v}$

53. Velocity changes from 1m/s to 11m/s in 10s. What will be the acceleration?

a. 1 m/s^2 b. 10 m/s^2 c. 11 m/s^2 d 12 m/s^2

54. Which is the first law of motion

a. v+at= u b. u+at = v c. ut +a=v d. ua+t=v

55. In the graph of Position-time, speed-time, velocity-time X co-ordinate is--------

a. Speed b. Time c. Position d. Velocity

56. A car starts from rest and in 5 sects moves 100m with uniform acceleration. What is the acceleration?

a. 8 m/s^2 b. 10 m/s^2 c. 100 m/s^2 d 5 m/s^2

57. Which of the force makes motion?

a. All force b. Balanced force c. Unbalanced force d. Internal force

58. The inability to move a body to change its state of rest or uniform motion is known as ----------

a. Inertia of motion b. Inertia at rest c. Rest d. State of motion

59. While running elephant can't change its direction easily because---------

a. Its size is big b. Its weight is greater

c. Elephant has big legs d. Elephant does not run speedly.

60. How do we measure momentum?

a. $\frac{m}{v}$ b. m x v c. $\frac{m^2}{v^2}$ d. $\frac{v}{m}$

Appendix III

UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

ACHIEVEMENT TEST IN PHYSICS

(For Standard IX Pupils)

(DRAFT)

RESPONSE SHEET

Name of the Student :…… Boy/Girl:…….

Name of the School : …….. Rural/Urban:.....

Type of Management: Govt./Private

Sl. No.					Sl. No.				
1.	a	b	c	d	31.	a	b	c	d
2.	a	b	c	d	32.	a	b	c	d
3.	a	b	c	d	33.	a	b	c	d
4.	a	b	c	d	34.	a	b	c	d
5.	a	b	c	d	35.	a	b	c	d
6.	a	b	c	d	36.	a	b	c	d
7.	a	b	c	d	37.	a	b	c	d
8.	a	b	c	d	38.	a	b	c	d
9.	a	b	c	d	39.	a	b	c	d
10.	a	b	c	d	40.	a	b	c	d
11.	a	b	c	d	41.	a	b	c	d
12.	a	b	c	d	42.	a	b	c	d
13.	a	b	c	d	43.	a	b	c	d
14.	a	b	c	d	44.	a	b	c	d
15.	a	b	c	d	45.	a	b	c	d
16.	a	b	c	d	46.	a	b	c	d
17.	a	b	c	d	47.	a	b	c	d
18.	a	b	c	d	48.	a	b	c	d
19.	a	b	c	d	49.	a	b	c	d
20.	a	b	c	d	50.	a	b	c	d
21.	a	b	c	d	51.	a	b	c	d
22.	a	b	c	d	52.	a	b	c	d
23.	a	b	c	d	53.	a	b	c	d
24.	a	b	c	d	54.	a	b	c	d
25.	a	b	c	d	55.	a	b	c	d
26.	a	b	c	d	56.	a	b	c	d
27.	a	b	c	d	57.	a	b	c	d
28.	a	b	c	d	58.	a	b	c	d
29.	a	b	c	d	59.	a	b	c	d
30.	a	b	c	d	60.	a	b	c	d

Appendix IV

UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

ACHIEVEMENT TEST IN PHYSICS

(For Standard IX Pupils)

(FINAL)

Prof. (Dr.) C. Naseema
Professor of Education

Gopalakrishnan. P.P
Research Scholar

Marks: 34

നിർദ്ദേശങ്ങൾ

തന്നിരിക്കുന്ന എല്ലാ ചോദ്യങ്ങൾക്കും A, B, C, D എന്നീ ഉത്തരങ്ങൾ കൊടുത്തിരിക്കുന്നു. ഇതിൽ ശരിയുത്തരം മനസ്സിലാക്കി പ്രത്യേകം തരുന്ന ഉത്തരക്കടലാസ്സിൽ ശരിയുത്തരത്തിന് നേരെയുള്ള ചതുരത്തിൽ 'X' എന്ന ചിഹ്നമിട്ട് രേഖപ്പെടുത്തുക.

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1. ആക്കത്തിന്റെ യൂണിറ്റ് ഏത്?
   a. kg x ms b. kgm/s c. kg s/m d. sm/kg
2. 10 kg മാസുള്ള വസ്തുവിന്റെ പ്രവേഗം 10 m/s ൽ നിന്ന് 20 m/s ആയാൽ ആക്കവ്യത്യാസം എത്ര?
   a. 100kgm/s b. 100ms/kg c. 200kg x ms d. 200sm/kg
3. 10kg മാസ് ഉള്ള വസ്തു നിശ്ചലാവസ്ഥയിൽ ആകുമ്പോൾ അതിന്റെ ആക്കം എത്ര?
   a. 10 b. 0 c. 1 d. 100
4. ബലത്തിന്റെ യൂണിറ്റ് ഏത്?
   a. N b Kg/s c Kg/ms d m/s
5. റോക്കറ്റ് മുകളിലേക്കുയരുന്നത് ഏത് നിയമത്തിന്റെ അടിസ്ഥാനത്തിലാണ്?
   a. ഒന്നാം ചലന നിയമം b. ഗുരുത്വാകർഷണ നിയമം
   c. രണ്ടാം ചലന നിയമം d. മൂന്നാം ചലന നിയമം
6. പ്രവർത്തനവും പ്രതിപ്രവർത്തനവും തമ്മിലുള്ള ബന്ധമെന്ത്?
   a. രണ്ടും തുല്യമാണ് b. രണ്ടും തുല്യവും ഒരേ ദിശയിലുമാണ്
   c. രണ്ടും തുല്യവും വിപരീത ദിശയിലുമാണ് d. രണ്ടും വിപരീത ദിശയിലാണ്.
7. തോണി തുഴയുമ്പോൾ പ്രവർത്തനം നടക്കുന്നതെവിടെ?
   a. □വെള്ളത്തിൽ b. തോണിയിൽ c. വായുവിൽ d. കരയിൽ
8. ആക്ക സംരക്ഷണം നിയമം അനുസരിച്ച് ബാഹ്യബലമില്ലെങ്കിൽ ഒരു വ്യൂഹത്തിന്റെ ആകെ ആക്കം എങ്ങനെയിരിക്കും.
   a. സ്ഥിരമായിരിക്കും b. വ്യത്യാസപ്പെട്ടിരിക്കും
   c. മാറിക്കൊണ്ടേയിരിക്കും d. പൂജ്യമായിരിക്കും
9. ജലത്തിനുള്ളിൽ മുങ്ങിക്കിടക്കുന്ന ഒരു വസ്തുവിനെ ഉയർത്തുമ്പോൾ അതിന്റെ ഭാരം അനുഭവപ്പെടുന്നതെങ്ങിനെ?

a. കുറഞ്ഞതായി b. കൂടിയതായി c. കൂടിയും കുറഞ്ഞും d. തുല്യമായി.

10. ഒരു വസ്തു ദ്രവത്തിൽ ഭാഗികമായോ, പൂർണ്ണമായോ മുങ്ങിയിരിക്കുമ്പോൾ ആ ദ്രവം വസ്തുവിൽ മുകളിലേക്ക് പ്രയോഗിക്കുന്ന ബലമാണ് ------ ?

a. പ്രതലബലം b. പ്ലവക്ഷമബലം c. ഇലാസ്തികബലം d. ആകർഷണബലം

11. ജലത്തേക്കാൾ സാന്ദ്രത കുറഞ്ഞ ഒരു ദ്രാവകമാണ്----------?

a. തേൻ b. മണ്ണെണ്ണ c. രസം d. ഉപ്പു വെള്ളം

12. മണ്ണെണ്ണ ജലത്തിൽ പൊങ്ങിക്കിടക്കുന്നു. കാരണം മണ്ണെണ്ണയുടെ സാന്ദ്രത --- .

a. ജലത്തേക്കാൾ കൂടുതലാണ് b. ജലത്തേക്കാൾ കുറവാണ്

c. ജലത്തിന് തുല്യമാണ് d. ജലത്തേക്കാൾ കൂടുതലോ കുറവോ ആണ്.

13. ജലത്തിന്റെ സാന്ദ്രത ---------- ആകുന്നു.

a. $100kg/m^3$. b. $100kg^3/m$ c. $1000kg/m^3$ d. $1000kg^3/m$

14. ദ്രാവകത്തിന്റെ ആപേക്ഷിക സാന്ദ്രത അളക്കാൻ ഉപയോഗിക്കുന്ന ഉപകരണമാണ് ----?

a. മീറ്റർ b. തെർമോമീറ്റർ c. കലോറിമീറ്റർ d. ഹൈഡ്രോമീററർ

15. ലാക്ടോമീറ്ററിന്റെ പ്രവർത്തനം ഏതുമായി ബന്ധപ്പെട്ടിരിക്കുന്നു?

a. പ്ലവനതത്വം b. ആർക്കമിഡീസ് തത്വം

c. ആകർഷണബലം d. ഗുരുത്വാകർഷണ ബലം

16. ഹൈഡ്രോളിക് ജാക് പ്രവർത്തിക്കുന്നത് ഏത് നിയമത്തിന്റെ അടിസ്ഥാനത്തിലാണ്?

a. പാസ്കൽ നിയമം b. ഗുരുത്വാകർഷണ നിയമം

c. ഒന്നാം ചലന നിയമം d. രണ്ടാം ചലന നിയമം

17. നേരിയ കുഴലിലൂടെ ദ്രാവകങ്ങൾ സ്വാഭാവികമായി ഉയരുകയോ താഴുകയോ ചെയ്യുന്ന പ്രതിഭാസമാണ് -------?

a. പ്ലവനം b. കേശീകത്വം c. ത്വരണം d. പ്ലവക്ഷമബലം

18. യൂണിറ്റ് പരപ്പളവിൽ അനുഭവപ്പെടുന്ന ബലത്തെ ------- എന്നു പറയുന്നു.

a. കേശീകത്വം b. ആകർഷണബലം c. വ്യാപ്തം d. മർദ്ദം

19. ദ്രാവകതുള്ളികൾ ഗോളാകൃതി പ്രാപിക്കുന്നതെന്തുകൊണ്ട് ?

a. പ്ലവക്ഷമബലം b ദ്രവബലം c. പ്രതലബലം d. ആന്തരിക ബലം

20. ഒരേ ഇനം തന്മാത്രകൾ തമ്മിലുള്ള ആകർഷണ ബലമാണ് --------?

a. അഡ്ഹിഷൻ ബലം b. കൊഹിഷൻ ബലം

c. ഗുരുത്വാകർഷണബലം d. ഘർഷണ ബലം

21. കേശിക ഉയർച്ച ഉണ്ടാകുന്നതെന്തുകൊണ്ട്?

a. അഡ്ഹിഷൻ ബലം കൂടുതലാകുമ്പോൾ

b. കോഹിഷൻ ബലം കൂടുതലാകുമ്പോൾ

c. അഡ്ഹിഷൻ ബലം കൂറവാകുമ്പോൾ

d. അഡ്ഹിഷൻ ബലവും കോഹിഷൻ ബലവും സമമാകുമ്പോൾ

22. വിസ്കബലം എന്നത് ഏത് തരം ബലമാണ് ?

a. ഘർഷണ ബലം b. ഗുരുത്വാകർഷണബലം

c. അഡ്ഹിഷൻ ബലം d. പ്ലവക്ഷമബലം

23. വിസ്കോസിറ്റി കൂടുതൽ ഏതിന് ?

a. ജലം b. തേൻ c. പെട്രോൾ d. ഉപ്പുവെള്ളം

24. ശരീരം തണുക്കുമ്പോൾ രക്തത്തിന്റെ വിസ്കോസിറ്റിക്ക് എന്ത് സംഭവിക്കുന്നു?

a. കൂടുന്നു b. കുറയുന്നു
c. കൂടുകയോ കുറയുകയോ ചെയ്യുന്നു d. ഒരു മാറ്റവും സംഭവിക്കുന്നില്ല.

25. കല്ലിന്റെ ഭാരം 100 N - ഉം, ജലത്തിൽ കല്ലിന്റെ ഭാരം 80N ഉം ആകുന്നു. ജലം കല്ലിൽ പ്രയോഗിച്ച പ്ലവക്ഷമബലം എത്ര?

a. 180 N b. 80 N c. 20 N d. 60 N

26. കപ്പൽ ജലത്തിൽ പൊങ്ങിക്കിടക്കുന്നു കാരണമെന്ത്? കപ്പൽ ആദേശം ചെയ്യുന്ന ജലത്തിന്റെ ഭാരം കപ്പലിന്റെ ----------

a. ഭാരത്തോടു തുല്യമായതിനാൽ b. ഭാരത്തേക്കാൾ കുറവായതിനാൽ
c. ഭാരവുമായി ബന്ധമില്ലാത്തതിനാൽ d. ഭാരത്തേക്കാൾ കൂടിയതിനാൽ

27. വായുവിലെ ഭാരം W1, ജലത്തിന്റെ ഭാരം W2, എന്നാൽ പ്ലവക്ഷമബലം എത്ര?

a. W1 + W2 b. W1 - W2 c. W1 x W2 d. W2 – W1

28. ലോഹക്കഷ്ണങ്ങളുടെ ആകൃതി മാറുമ്പോൾ അതിന് എന്ത് സംഭവിക്കുന്നു?

a. മാസ് വ്യത്യാസപ്പെടുന്നു b. ഭാരം വ്യത്യാസപ്പെടുന്നു
c. വ്യാപ്തം വ്യത്യാസപ്പെടുന്നു
d. മാസും ഭാരവും വ്യാപ്തവും വ്യത്യാസപ്പെടുന്നു.

29. ചലിച്ചുകൊണ്ടിരിക്കുന്ന വസ്തുക്കളുടെ വേഗവുമായി ബന്ധപ്പെട്ട് S എന്ന പ്രതീകം ഏതിനെ സൂചിപ്പിക്കുന്നു?

a. വേഗത b. ത്വരണം c. സ്ഥാനാന്തരം d. പ്രവേഗം

30. ത്വരണം =

a. $\frac{v-u}{t}$ b. $\frac{v+u}{t}$ c. $\frac{v+t}{u}$ d. $\frac{u+t}{v}$

31. 10 S സമയത്തിനുള്ളിൽ പ്രവേഗം 1 m/s ൽ നിന്ന് 11 m/s ആയി എങ്കിൽ അതിന്റെ ത്വരണം എത്ര?

a. 1 m/s^2 b. 10 m/s^2 c. 11 m/s^2 d. 12 m/s^2

32. ഒന്നാം ചലന സമവാക്യം ഏത്?

a. v+at= u b. u+at = v c. ut +a=v d. ua+t=v

33. ആനയ്ക്ക് ഓട്ടത്തിനിടയിൽ പെട്ടെന്ന് ദിശമാറ്റാൻ കഴിയാത്തതിന് കാരണം

a. അതിന്റെ വലുപ്പം കൂടുതലാണ് b. അതിന്റെ ഭാരം കൂടുതലാണ്
c. ആനയ്ക്ക് വലിയ കാലുകളാണ് d. ആന വേഗത്തിൽ ഓടുന്നില്ല.

34. ആക്കം അളക്കുന്നതെങ്ങിനെ?

a. $\frac{m}{v}$ b. m x v c. $\frac{m^2}{v^2}$ d. $\frac{v}{m}$

Appendix V

UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

ACHIEVEMENT TEST IN PHYSICS (Final)

(For Standard IX Pupils)

Dr. C. Naseema
Professor of Education

Gopalakrishnan. P.P
Research Scholar

Marks: 34

Instructions

Four choices is given for all the following questions. Select the correct answer. Mark X in the correct answer box in the separate answer sheet given.

1. What is the unit of momentum?
   a. kg x ms b. kgm/s c. kg s/m d. sm/kg
2. If the velocity of a body with mass 10kg changes from 10m/s to 20m/s. What will be the change in the momentum?
   a. 100kgm/s b. 100ms/kg c. 200kg x ms d. 200sm/kg
3. What will be the momentum of a body at rest if mass is 10 kg?
   a. 10 b. 0 c. 1 d. 100
4. What is the unit of force?
   a. N b. kg/s c. kg/ms d. m/s
5. Which law is the basis of shooting up of rocket?
   a. First law of motion b. Gravitational law
   c. Second law of motion d. Third law of motion
6. What is the relation between action and reaction?
   a. Both are equal b. Both are equal and in same direction
   c. Both are equal and in opposite direction d. Both are in opposite direction
7. Where does the action take place when a boat is rowed?
   a. on water b. on boat c. On air d. On ground
8. What will be the total momentum of a system in the absence of an external force according to law of conservation of momentum?
   a. Constant b. Different c. Changing d. Zero
9. What do we experience to the weight when a body immersed in water is lifted?
   a. Decreased b. Increased c. Increased and decreased d. Equal
10. When a body is immersed completely or partially in a liquid the upward force exerted by the liquid on the body is
    a. Surface tension b. Buoyancy c. Elastic force d. Force of attraction

11. Liquid less denser than water is ----------?

a. Honey b. Kerosene c. Mercury d. Salt water.

12. Kerosene is floating on water because density of kerosene is ----------

a. Greater than water b. Less than water

c. Equal to water d. Either greater or less than water

13. The density of water is ---------

a. 100kg/m^3. b. 100$kg^{3/}$m c. 1000kg/m^3 d. 1000kg^3/m

14. The equipment used for measuring the relative density is ---------

a. Meter b. Thermometer c. Calorimeter d. Hydrometer.

15. Which is related to the working of lactometer?

a. Law of floation b. Archimedes principle

c. Attraction force d. Gravitational force.

16. What is the principle in the working of hydrolic jack?

a. Pascal's law b. Gravitational law

c. First law of motion d. Second law of motion.

17. The rise or depression of liquids in narrow tube is-------

a. Floatation b. capillarity c. Acceleration d. Buoyancy

18. Force acting on a unit area is ----------

a. Capillarity b. Attractive force c. Volume d. Pressure

19. Why do liquid drops take a spherical shape?

a. Buoyancy b. Force of liquid c. Surface tension d. Internal Force.

20. The attraction between same type of molecules is ----------

a. Adhesive force b. Cohesive force c. Gravitational force d. Frictional force.

21. Why does capillary rise occur?

a. When adhesive force is greater b. Cohesive force is greater

c .Adhesive force is less d. Adhesive force and cohesion force are equal.

22. What type of force is viscous force?

a. Frictional force b. Gravitational force c. Adhesive force d. Buoyancy.

23. For which viscosity is greater?

a. Water b. Honey c. petrol d. Salt water

24. What happens to the viscosity of blood when body temperature decreases?

a. Increases b. Decreases

c. Either increases or decreases d. No change occurs.

25. The weight of stone is 100N and the weight of stone in water is 80 N. What is the buoyancy that water act on stone?

a. 180N b. 80N c. 20N d. 60N

26. When a ship float in water, the weight of the displaced water will be ----------

a. Equal to the weight of ship. b. Less than the weight of ship.

c. Not related to the weight of the ship d. Greater than the weight of the ship

27. Weight in air is W_1, the weight of the water is W_2, then what is buoyancy?

a. W1 + W2 b. W1 - W2 c. W1 x W2 d. W2 – W1

28. What happens when the shape of metal pieces change?

a. Mass change b. Weight change

c. Volume change d. Mass, weight and volume change

29. What does 'S' represent related to the speed of moving body?

a. Speed b. Acceleration c. Displacement d. Velocity

30. Acceleration =

a. $\frac{v-u}{t}$ b. $\frac{v+u}{t}$ c. $\frac{v+t}{u}$ d. $\frac{u+t}{v}$

31. Velocity changes from 1m/s to 11m/s in 10s. What will be the acceleration?

a. 1 m/s^2 b. 10 m/s^2 c. 11 m/s^2 d 12 m/s^2

32. Which is the first law of motion

a.v+at= u b. u+at = v c. ut +a=v d. ua+t=v

33. While running elephant can't change its direction easily because---------

a. Its size is big b. Its weight is greater

c. Elephant has big legs d. Elephant does not run speedly.

34. How is momentum measured?

a. $\frac{m}{v}$ b. m x v c. $\frac{m^2}{v^2}$ d. $\frac{v}{m}$

Appendix VI

UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

ACHIEVEMENT TEST IN PHYSICS

(For Standard IX Pupils)
(FINAL)

RESPONSE SHEET

Name of the Student :…… Boy/Girl:…….

Name of the School : …….. Rural/Urban:.....

Type of Management: Govt./Private

Sl. No.					Sl. No.				
1.	a	b	c	d	18.	a	b	c	d
2.	a	b	c	d	19.	a	b	c	d
3.	a	b	c	d	20.	a	b	c	d
4.	a	b	c	d	21.	a	b	c	d
5.	a	b	c	d	22.	a	b	c	d
6.	a	b	c	d	23.	a	b	c	d
7.	a	b	c	d	24.	a	b	c	d
8.	a	b	c	d	25.	a	b	c	d
9.	a	b	c	d	26.	a	b	c	d
10.	a	b	c	d	27.	a	b	c	d
11.	a	b	c	d	28.	a	b	c	d
12.	a	b	c	d	29.	a	b	c	d
13.	a	b	c	d	30.	a	b	c	d
14.	a	b	c	d	31.	a	b	c	d
15.	a	b	c	d	32.	a	b	c	d
16.	a	b	c	d	33.	a	b	c	d
17.	a	b	c	d	34.	a	b	c	d

Appendix VII

UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

ACHIEVEMENT TEST IN PHYSICS

(For Standard IX Pupils)

(FINAL)

Scoring Key

Qn. No.	Key
1.	b
2.	a
3.	b
4.	a
5.	d
6.	c
7.	a
8.	a
9.	a
10.	b
11.	b
12.	b
13.	c
14.	d
15.	a
16.	a
17.	b

Qn. No.	Key
18.	d
19.	c
20.	b
21.	a
22.	a
23.	b
24.	a
25.	c
26.	a
27.	b
28.	c
29.	c
30.	a
31.	a
32.	b
33.	b
34	b

Appendix VIII

UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

ACHIEVEMENT TEST IN CHEMISTRY

(For Standard IX Pupils)

(DRAFT)

Dr. C. NASEEMA
Professor of Education

Gopalakrishnan. P.P
Research Scholar

Marks: 60

നിർദ്ദേശങ്ങൾ

തന്നിരിക്കുന്ന എല്ലാ ചോദ്യങ്ങൾക്കും A, B, C, D എന്നീ ഉത്തരങ്ങൾ കൊടുത്തിരിക്കുന്നു. ഇതിൽ ശരിയുത്തരം മനസ്സിലാക്കി പ്രത്യേകം തരുന്ന ഉത്തരക്കടലാസ്സിൽ ശരിയുത്തരത്തിന് നേരെയുള്ള ചതുരത്തിൽ 'X' എന്ന ചിഹ്നമിട്ട് രേഖപ്പെടുത്തുക.

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1. പരമാണു സിദ്ധാന്തം ആദ്യമായി പ്രസ്താവിച്ചതാർ?

   A) ലൂസിപ്പസ് B) അരിസ്റ്റോട്ടിൽ C) കണാദൻ D) ലുക്രീഷ്യസ്

2. മാസ് സംരക്ഷണ നിയമം ആവിഷ്കരിച്ച ശാസ്ത്രജ്ഞൻ ആർ?

   A) ലാവോസിയ B) ന്യൂട്ടൻ C) അരിസ്റ്റോട്ടിൽ D) പ്ലേറ്റോ

3. ഒരു രാസ പ്രവർത്തനത്തിൽ മാസ് -------- ?

   A) നിർമ്മിക്കപ്പെടുന്നു
   B) നശിപ്പിക്കപ്പെടുന്നു.
   C) നിർമ്മിക്കുകയും നശിപ്പിക്കുകയും ചെയ്യുന്നു.
   D) നിർമ്മിക്കുകയും നശിപ്പിക്കുകയും ചെയ്യുന്നില്ല.

4. കാർബൺഡൈഓക്സൈഡിൽ കാർബണിന്റെയും ഓക്സിജന്റേയും മാസുകൾ തമ്മിലുള്ള അംശബന്ധം എത്ര?

   A) 3:8 B) 8:4 C) 8:3 D) 1:8

5. രാസ സംയോജന നിയമങ്ങൾക്കു വേണ്ടി ആറ്റം സിദ്ധാന്തം അവതരിപ്പിച്ച ബ്രിട്ടീഷ് ശാസ്ത്രജ്ഞൻ ആർ?

   A) ന്യൂട്ടൻ B) ലാവോസിയ C) ജോൺഡാൾഡട്ടൻ D) ലുക്രീഷ്യസ്

6. എക്സ്റേ കണ്ടെത്തിയത് ആർ?

   A) ഫാരഡെ B) റോൺടജൻ C) തോംസൺ D) എഡിസൺ

7. ഗോൾഡ് കോയിലിൽ ആൽഫാ കണം പതിപ്പിച്ച് പരീക്ഷണം നടത്തിയ ശാസ്ത്രജ്ഞൻ ആർ?

   A) തോംസൺ B) ഗോൾഡ് സ്റ്റെയിൻ C) ന്യൂട്ടൻ D) റൂഥർഫോർഡ്

8. ഗോൾഡ് ഫോയിൽ പരീക്ഷണത്തിൽ വളരെ കുറച്ച് ആൽഫകണങ്ങൾ മാത്രം പ്രതിഫലിക്കാൻ കാരണം ---------

A) ആറ്റത്തിന്റെ ഉള്ളിൽ ഭൂരിഭാഗം സ്ഥലം ശൂന്യമാണ് .

B) ആറ്റത്തിന്റെ ഉള്ളിൽ ഭൂരിഭാഗം സ്ഥലം ശൂന്യമല്ല .

C) ആറ്റം എല്ലാ കണങ്ങളേയും കടത്തി വിടുന്നു.

D) ആറ്റം എല്ലാ കണങ്ങളേയും തടഞ്ഞു വെക്കുന്നു.

9. ആൽഫാ കണത്തിന്റെ ചാർജ് എന്ത്?

A) +ve
B) - ve
C) +ve വും - veവും ആണ്
D) +ve ഓ - ve ഓ അല്ല.

10. ആറ്റത്തിന്റെ ചാർജ്ജ് എന്ത്?

A) ചാർജ് ഇല്ല
B) + ve ചാർജ് ഉണ്ട്
C) +ve ഓ - ve ഓ ചാർജ്ജില്ല
D) +ve ഉം - ve ഉം ചാർജ് ഉണ്ട്.

11. യോജിക്കാത്തത് തിരഞ്ഞെടുത്തെഴുതുക

A) ആറ്റത്തിന് ന്യക്ലിയസ്സ് ഉണ്ട്
B) ആറ്റത്തിനെ അപേക്ഷിച്ച് ന്യുക്ലിയസ്സ് വളരെ ചെറുതാണ്.
C) ന്യൂക്ലിയസ്സിന് ചാർജ് ഇല്ല
D) ഇലക്ട്രോണുകൾ ന്യൂക്ലിയസ്സിനു ചുറ്റും ചലിക്കുന്നു.

12. ആൽഫാ കണങ്ങൾക്ക് എത്രയൂണിറ്റ് ചാർജ് ഉണ്ട് ?

A) 2 യൂണിറ്റ് +ve
B) 2 യൂണിറ്റ് - ve
C) 4 യൂണിറ്റ് +ve
D) 4 യൂണിറ്റ് - ve

13. ബോറിന്റെ ആറ്റം മാതൃകയിൽ ന്യക്ലിയസ്സിൽ നിന്നും അകലം കൂടുന്തോറും ഷെല്ലുകളുടെ ഊർജം ------

A) കുറയുന്നു.
B) കുറഞ്ഞും കൂടിയും വരുന്നു.
C) കുറയുന്നോ കൂടുന്നോ ഇല്ല
D) കൂടുന്നു.

14. ന്യൂട്രോണുകളുടെ സാന്നിദ്ധ്യം സ്ഥിരീകരിച്ച ശാസ്ത്രജ്ഞൻ ആർ?

A) ചാഡ്വിക്.
B) ഐൻസ്റ്റീൻ.
C) ഡാർവിൻ
D) റൂഥർ ഫോർഡ്.

15. പ്രോടോണിന്റെ മാസ്സ് 1.00727u ആകുമ്പോൾ ന്യൂട്രോണിന്റെ മാസ്ഏത്?

A) .00727
B) .00548
C) .00352
D) 1.00866

16. ആറ്റങ്ങൾ പരസ്പരം ഉരസുമ്പോൾ സ്ഥാനമാറ്റം സംഭവിക്കാൻ സാദ്ധ്യതയുള്ള കണമേത്?

A) പ്രോട്ടോൺ
B) ന്യൂട്രോൺ
C) ന്യൂട്രിനോ
D) ഇലക്ട്രോൺ

17. ആറ്റത്തിലെപ്രോട്ടോണുകളുടെ ആകെ എണ്ണത്തെ -------- എന്നുപറയുന്നു?

A) ആറ്റോമിക്മാസ്
B) ആറ്റോമികനമ്പർ
C) ആറ്റോമികഘടന
D) ആറ്റോമികഭാരം

18. മൗലിക കണങ്ങളല്ലാത്തത് ഏത്?

A) മീസോൺ B) പ്രോട്ടോൺ C) ഇലക്ട്രോൺ D) ന്യൂട്രോൺ

19. മാസ്നമ്പർ - ആറ്റോമികനമ്പർ = --------?

A) പ്രോട്ടോണുകളുടെ എണ്ണം B) ന്യൂട്രോണുകളുടെ എണ്ണം
C) ഇലക്ട്രോണുകളുടെ എണ്ണം ം D) ന്യൂട്രിനോയുടെ എണ്ണം

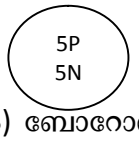
20. Na എന്നത് ഏതു മൂലകത്തെ സൂചിപ്പിക്കുന്നു?

A) സോഡിയം B) പൊട്ടാസ്യം C) കാൽസ്യം D) മെഗ്നീഷ്യം

21. M എന്ന ഷെൽ എത്രാമത്തെ ഷെൽ ആണ്.?

A) . ഒന്ന് B) രണ്ട് C) മൂന്ന് D) നാല്

22. താഴെ കൊടുത്തിരിക്കുന്നത് ഏത് മൂലകത്തിന്റെ ന്യൂക്ലിയസ് ആണ്?



A) ഹീലിയം B) ബോറോൺ C) ലിതിയം D ബെറിലിയം

23. K എന്ന ഷെല്ലിൽ ഉൾക്കൊള്ളാവുന്ന പരമാവധി ഇലക്ട്രോണുകളുടെ എണ്ണം.?

A) 2 B) 3 C) 4 D) 5

24. ഡ്യൂട്ടീരിയം ---------- മൂലകത്തിന്റെ ഐസോടോപ്പ് ആകുന്നു?

A) ഹൈഡ്രജൻ B) ഹീലിയം C) സോഡിയം D) കാൽസ്യം

25. N^{15}, $_{6}C)^{14}$ എന്നിവ----------ആകുന്നു?

A) ഐസോടോപ്പുകൾ B) ഐസോബാറുകൾ
C) ഐസോടോണുകൾ D) ഒരേ ഇനം ആറ്റങ്ങൾ

26. വൈദ്യുതകാന്തിക സിദ്ധാന്തം മുന്നോട്ടു വെച്ച ശാസ്ത്രജ്ഞൻ ആര്?

A) നീൽസ്ബോർ B) ന്യൂട്ടൻ C) ഡാൾട്ടൻ D) മാക്സ്വെൽ

27. ന്യൂക്ലിയസിനു ചുറ്റും ഇലക്ട്രോണുകൾ എവിടെയാണ് ചലിക്കുന്നത് ?

A) നേർരേഖയിൽ B) വർത്തുളമായി C) ഷെല്ലുകളിൽ D) ആറ്റത്തിൽ

28. ന്യൂക്ലിയസ്സിൽ നിന്നുള്ള അകലം കൂടുന്തോറും ഇലക്ട്രോണുകളുടെ ഊർജത്തിന് വരുന്ന മാറ്റം എന്ത്?

A) ഊർജംകുറയുന്നു B) ഊർജത്തിന് മാറ്റമില്ല
C) ഊർജം കൂടുന്നു. D) ഊർജം കൂടുകയോ കുറയുകയോ ചെയ്യാം.

29. ആറ്റത്തിന്റെ ന്യക്ലിയസിന്റെ ചാർജ് എന്ത്?

A) ചാർജ് ഇല്ല B) - veചാർജ്
C) +ve ചാർജ് D) +ve ഓ – ve ഓ ആകാം.

30. പ്രോട്ടോണുകളുടെ സാന്നിദ്ധ്യം സ്ഥിരീകരിച്ച ശാസ്ത്രജ്ഞൻ ആർ?

A) മാക്സ് വെൽ B) ബോർ C) റൂഥർഫോർഡ് D) ഒന്നുമല്ല.

31. ഹീലിയത്തിന്റെ ബാഹ്യതമ ഷെല്ലിലെ ഇലക്ട്രോണുകളുടെ എണ്ണം എത്ര ?

A) 1 B) 2 C) 8 D) 0

32. ഓക്സിജന്റെ ആറ്റോമിക നമ്പർ 8 ആകുന്നു. ബാഹ്യതമഷെല്ലിലെ ഇലക്ട്രോണുകളുടെ എണ്ണം എത്ര?

A) 1 B) 2 C) 8 D) 6

33. തന്മാത്രകളിലെ ആറ്റങ്ങളെ ചേർത്ത് നിർത്തുന്ന ബലത്തിന്റെ പൊതുവെയുള്ള പേർ എന്ത് ?

A) ഗുരുത്വാകർഷണബലം B) അയോണികബന്ധനം

C) ലോഹ ബന്ധനം D) രാസ ബന്ധനം

34. മൂലകത്തിന്റെ പ്രതീകത്തിന് ചുറ്റും ഇലക്ട്രോണുകളെ കുത്തുകൾ ഉപയോഗിച്ച് ചിത്രീകരിക്കുന്ന രീതി ആദ്യമായി അവലംഭിച്ചതാര് ?

A) ഗിൽബർട്ട് എൻ.ലൂയിസ് B) റൂഥർഫോർഡ്

C) ന്യൂട്ടൻ D) ഡാൾട്ടൻ

35. ഏകബന്ധനത്തിന് ഉദാഹരണമേത് ?

A) N_2 B) O_2 C) F_2 D) Fe

36. സോഡിയം ക്ലോറൈഡ് തന്മാത്രയെ $(Na)^{+}(C)l)^{-}$എന്ന് സൂചിപ്പിക്കാൻ കാരണം?

A) സോഡിയത്തിന് പ്രോട്ടോൺ ലഭിക്കുന്നതു കൊണ്ട് 0

B) സോഡിയത്തിന് ഇലക്ട്രോൺ നഷ്ടമാവുന്നതു കൊണ്ട്

C) ക്ലോറിന് പ്രോട്ടോൺ ലഭിക്കുന്നതു കൊണ്ട്

D) ക്ലോറിന് പ്രോട്ടോൺ നഷ്ടമാകുന്നതു കൊണ്ട്

37. ത്രി ബന്ധനത്തിന് ഒരു ഉദാഹരണമെഴുതുക ?

A) F_2 B) B)r_2 C) O_2 D) N_2

38. അയോണിക ബന്ധനത്തിൽ സംഭവിക്കുന്നതെന്ത് ?

A) ഇലക്ട്രോണുകൾ പങ്കിടുന്നു. B) ഇലക്ട്രോൺ കൈമാറ്റം ചെയ്യുന്നു.

C) പ്രോട്ടോൺ പങ്കിടുന്നു. D) പ്രോട്ടോൺ കൈമാറ്റം ചെയ്യുന്നു.

39. അയോണിക ബന്ധനത്തിൽ അയോണുകളെ ചേർത്തു നിർത്തുന്ന ബലം ഏത് ?

A) വിപരീത ചാർജുള്ള അയോണുകളുടെ വൈദ്യുതാഘർഷണ ബലം

B) ഒരേ ചാർജ്ജുള്ള അയോണുകളുടെ വൈദ്യുത വികർഷണ ബലം

C) ഇലക്ട്രോണുകളും ഇലക്ട്രോണുകളും തമ്മിലുള്ള വികർഷണ ബലം

D) തന്മാത്രകൾ തമ്മിലുള്ള ആകർഷണ ബലം

40. $(Mg)^{7+}$ $(0)^{1-}$ എന്നതിലെ തെറ്റ് തിരുത്തുക.

A) $(Mg)^{2-}$ $(0)^{2+}$ B) $(Mg)^{8-}(O)^{8+}$ C) $(Mg)^{2+}(O)^{2--}$ D) $(Mg)^{6+}(O)^{2--}$

41. ഫ്ളൂറിന്റെ ഇലക്ട്രോൺ വിന്യാസം ഏത് ?

A) 2,7 B) 1,8 C) 7,2 D) 8,1

42. സഹസംയോജക ബന്ധനത്തിൽ സംഭവിക്കുന്നതെന്ത്?

A) ഇലക്ട്രോണുകൾ പങ്കിടുന്നു.

B) ഇലക്ട്രോൺ കൈമാറ്റം ചെയ്യുന്നു.

C) ഇലക്ട്രോണുകൾ പങ്കിടുകയോ കൈമാറ്റം ചെയ്യുകയോ ചെയ്യുന്നു..

D) ഇലക്ട്രോണുകൾ പങ്കിടുകയോ കൈമാറ്റം ചെയ്യുകയോ ചെയ്യുന്നില്ല.

43. സഹസംയോജക ബന്ധനത്തിന് ഒരു ഉദാഹരണം ഏത് ?

A) Nacl B) Mg_2O C) F_2 D) Na_2O

44. സഹ സംയോജക സ്വഭാവമുള്ള സംയുക്തങ്ങളിലെ ഘടക മൂലകങ്ങളുടെ ഇലക്ട്രോ നെഗറ്റിവിറ്റി യിലുള്ള വിത്യാസം എത്ര ?

A) 2 B) 2ൽ കൂടുതൽ C) 1.7 ൽ കൂടുതൽ D) 1.7 ൽ കുറവ്

45. ദ്വിബന്ധനത്തിന് ഒരു ഉദാഹരണമെഴുതുക ?

A) F_2 B) O_2 C) C)l_2 D) N_2

46. Na^+ ഏതു തരം അയോണാണ്?

A) ആനയോൺ B) പോസിട്രോൺ C) ന്യൂട്രിനോ D) കാറ്റയോൺ

47. കാർബൺ ആറ്റത്തിന് അഷ്ടകം പൂർത്തിയാക്കാൻ എത്ര ഇലക്ട്രോൺ വേണം ?

A) 4 B) 8 C) 2 D) 3

48. കാർബൺ ടെട്രാക്ലോറൈഡ് തന്മാത്രയിലെ ബന്ധനം ഏതു തരത്തിൽ പെട്ടതാണ്.?

A) അയോണികബന്ധനം B) ലോഹീയബന്ധനം

C) കാന്തിക ബന്ധനം D) സഹസംയോജക ബന്ധനം

49. ഇലക്ട്രോ നെഗറ്റിവിറ്റി എന്നാൽ എന്ത് ?

A) ബന്ധിത ഇലക്ട്രോണുകളെ ആകർഷിക്കാനുള്ള കഴിവ്.

B) ബന്ധിതമല്ലാത്ത ഇലക്ട്രോണുകളെ വികർഷിപ്പിക്കാനുള്ള കഴിവ്.

C) ബന്ധിതമല്ലാത്ത ഇലക്ട്രോണുകളുടെ ആകർഷണം

D) ബന്ധിത ഇലക്ട്രോണുകളുടെ വികർഷണം

50. ആരുടെ ഇലക്ട്രോ നെഗറ്റിവിറ്റി സ്കെയിലാണ് കൂടുതൽ പ്രചാരം നേടിയത്?

A) ന്യൂട്ടൻ B) റൂഥർഫോർഡ് C) എഡിസൺ D) ലീനസ് പോളിംഗ്

51. ഇലക്ട്രോ നെഗറ്റിവിറ്റിയുടെ കൂടിയ വില ഏത് ?

A) -4 B) 4 C) -1 D) 1

52. ഇലക്ട്രോ നെഗറ്റിവിറ്റിയുടെ ഏറ്റവും കൂടിയ മൂലകം ഏത് ?

A) O B) F C) C)l D) C)

53. അയോണിക സ്വഭാവമുള്ള സംയുക്തങ്ങളിലെ ഘടകമൂലകങ്ങളുടെ ഇലക്ട്രോ നെഗറ്റിവിറ്റി വിലകൾ തമ്മിലുള്ള വിത്യാസം എത്ര ?

A) 1 ൽ കൂടുതൽ B) 1 ൽ കുറവ് C) 1.7 ൽ കൂടുതൽ D) 1.7 ൽ കുറവ്

54. രാസപ്രവർത്തനത്തിൽ പങ്കെടുക്കുന്ന ഇലക്ട്രോണുകൾ എവിടെ സ്ഥിതി ചെയ്യുന്നു. ?

A) ആന്തരിക ഷെല്ലിൽ B) ന്യൂക്ലിയസ്സിൽ

C) ആറ്റത്തിന് പുറത്ത് D) ബാഹ്യതമ ഷെല്ലിൽ

55. ദ്വയാറ്റോമിക തന്മാത്രകളിൽ പങ്കുവെക്കപ്പെടുന്ന ഇലക്ട്രോൺ ജോഡിയെ അവ തുല്യമായി ആകർഷിക്കുന്നതിന് കാരണം എന്ത് ?

A) ഇലക്ട്രോനെഗറ്റിവിറ്റി വിത്യസ്തമായതിനാൽ

B) ഇലക്ട്രോനെഗറ്റിവിറ്റി തുല്യമായതിനാൽ

C) ന്യക്ലിയസ് പോസിറ്റീവ് ചാർജ് ആയതിനാൽ

D) ന്യക്ലിയസ്സിൽ ന്യട്രോൺ ഉള്ളതുകൊണ്ട്.

56. പൊതുവെ മോളിക്യുലർ മാസ് കുറഞ്ഞിരുന്നിട്ടും ജലം ഒരു ദ്രാവകമാണ് എന്തുകൊണ്ട്?

A) ജലം ഒരു പോളാർ സംയുക്തമല്ല

B) ജലം ഒരു പോളാർ സംയുക്തമാണ്

C) ജലം നല്ല ഒരു ലായകമാണ്

D) ജലത്തിന് പ്രതല ബലം കൂടുതലാണ്.

57. അയോണിക സംയുക്തത്തിന്റെ പ്രത്യേകത എന്ത് ?

A) ഖരാവസ്ഥ, ജലത്തിൽ ലയിക്കുന്നു.

B) ഖരാവസ്ഥ, ജലത്തിൽ ലയിക്കുന്നില്ല

C) ദ്രാവകാവസ്ഥ, ജലത്തിൽ ലയിക്കുന്നു

D) ദ്രാവകാവസ്ഥ, ജലത്തിൽ ലയിക്കുന്നില്ല.

58 കാർബണിന്റെ സംയോജകത എത്ര ?

A) 1 B) 2 C) 3 D) 4

59. ആറ്റങ്ങളുടെ സംയോജകത കണക്കാക്കുന്നതെങ്ങനെ ?

A) വിട്ടുകൊടുക്കുന്ന ഇലക്ട്രോണുകളുടെ എണ്ണം

B) സ്വീകരിക്കുന്ന ഇലക്ട്രോണുകളുടെ എണ്ണം

C) പങ്കുവെക്കുന്ന ഇലക്ട്രോണുകളുടെ എണ്ണം

D) വിട്ടുകൊടുക്കുകയോ സ്വീകരിക്കുകയോ, പങ്കുവെക്കുകയോ ചെയ്യുന്ന ഇലക്ട്രോണുകളുടെ എണ്ണം

60. അലുമിനിയം ക്ലോറൈഡിന്റെ രാസസൂത്രം $A(lC)l_3$ ഇതിൽ നിന്നും അലുമിനിയത്തിന്റെ സംയോജകത എത്രയാണെന്ന് എഴുതുക ?

A) 1 B) 4 C) 2 D) 3

Appendix IX

UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

ACHIEVEMENT TEST IN CHEMISTRY

(For Standard IX Pupils)

(DRAFT)

Dr. C. NASEEMA
Professor of Education

Gopalakrishnan. P.P
Research Scholar

Marks: 60

Instructions

Four choices such as A,B,C,D are given for all the following questions. Select the correct answer. Mark 'X' in the box for the correct answer, in the separate answer sheet given

1. Who put forward the theory of "Paramanu"?
   A. Leucippus B. Aristotle C. Kanada D. Lucretius
2. Who proposed the law of conservation of mass?
   A. Lavoisier B. Newton C. Aristotle D. Plato
3. In a chemical reaction mass is--------
   A. Created B. Destroyed
   C. Created and destroyed D. Neither Created nor destroyed
4. What is the ratio of masses of oxygen and carbon in carbon dioxide?
   A. 3:8 B. 8:4 C. 8:3 D. 1:8
5. Who introduced atomic theory for explaining laws of chemical reaction?
   A. Newton B. Lavoisier C. John Dalton D. Lucretius
6. Who discovered X-ray?
   A. Faraday B. Roentgen C. Thomson D. Edison
7. Who conducted the gold foil experiments by making alpha particle fall on gold foil?
   A. Thomson B. Gold Stein C. Newton D. Rutherford
8. In the gold foil experiment only a very few alpha particle reflected because -------
   A. Most of the space in an atom is empty.
   B. Most of the space in an atom is not empty.
   C. Atom allows all the particle to pass through
   D. Atom obstructs all the particles
9. What is the charge of alpha particle?
   A. +ve B. –ve C. +ve and –ve D. Either +ve or -ve

10. What is the charge of an atom?

A. No charge B. +ve charge C. Neither +ve nor -ve D. +ve and -Ve

11. Slect which is not correct

A. Atom has a nucleus B. Compared to the atom nucleus is very small.

C. Nucleus has no charge D. Electrons are moving around nucleus

12. How many unit of charge is for alpha particle?

A. 2 unit +ve B. 2 unit -ve C. 4 unit +ve D. 4 unit –ve

13. In Bohr model of atom what will happen to the energy of the shell as its distance from the nucleus increases?

A. Decreases B. Decrease and increase

C. Neither increase nor decrease D. Increase

14. Who confirmed the presence of Neutrons?

A. Chadwick B. Einstien C. Darwin D. Rutherford

15. What will be the mass of neutron if the mass of proton is 1.00727u?

A. .00727 B. .00548 C. .00352 D. 1.00866

16. Which particle has a chance to be got displaced when rubbed each other?

A. Proton B. Neutron C. Neutrino D. Electron.

17. The total number of proton is known as ----------

A. Atomic mass B. Atomic number

C. Atomic structure D. Atomic weight

18. Which is not a fundamental particle?

A. Meson B. Proton C. Electron D. Neutron

19. Mass number - Atomic number = ----------?

A. Number of protons B. Number of neutrons

C. Number of electrons D. Number of neutrino.

20. Which element is represented by the symbol Na

A. Sodium B. Potassium C. calcium D. Magnesium

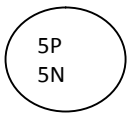
21. What is the number order of M shell?

A. One B. Two C. Three D. Four

22. What is the maximum number of electrons that K shell can contain?

A. 2 B. 3 C. 4 D. 5

23. The nucleus of Which element is given in the figure?



A. Helium B. Boron C. Lithium D. Berlium

24. Deuterium is the isotope of ---------- ----------element

A. Hydrogen B. Helium C. Sodium D. Calcium

25. $_7N^{15}$, $_6C^{14}$ are-------

A. Isotope B. Isobar C. Isotone D. Same type of atom

26. Who put forward the electro magnetic theory?

A. Niels Bohr B. Newton C. Dalton D. Maxwell

27. Where do electrons move around the nucleus?

A. In straight line B. In circular path C. In shell D. In atom

28. What change in the energy of electron does occur as the distance from nucleus increases?

A. Energy decreases B. No change in energy

C. Energy increases D. Energy will either increase or decrease

29. What is the charge of the nucleus of the atom?

A. No charge B. -ve charge C. +ve charge D. +ve or -ve

30. Who confirmed the presence of proton?

A. Maxwell B. Bohr C. Rutherford D. None

31. How many electrons does helium have in its outermost shell?

A. 1 B. 2 C. 8 D. 0

32. The atomic number of oxygen is 8. What is the number of electrons in its outermost shell?

A. 1 B. 2 C. 8 D. 6

33. What is the name of the force that holds the atom together in a molecule?

A. Gravitational force B. Ionic bonding

C. Metalic bonding D. Chemical bonding.

34. Who introduced the method of representing electrons using dots?

A. Gilbert N Lewis B. Rutherford C. Newton D. Dalton

35. Which of the following is an example for single bond?

A. A. N_2 B. O_2 C. F_2 D. Fe

36. Why do we represent sodium chloride molecule (Na)+ (Cl) -?

A. Sodium accepts proton B. Sodium donates electron

C. Chlorine accepts Proton D. Chlorine donates proton

37. Write an example for triple bond

A. F_2 B. Br_2 C. O_2 D. N_2

38. What happens the ionic bond?

A. Electron sharing B. Electron exchanging

C. Proton sharing D. Proton exchanging

39. What is the force that unites the ions in ionic bond?

A. The electrostatic attraction of the ions having opposite charges

B. The electrostatic repulsion of the ions having same charges

C. The repulsive force between electrons

D. The attraction between molecule

40. Correct the fault in $(Mg)^{7+}$ $(0)^{1-þ}$

A. $(Mg)^{2-}$ $(0)^{2+}$ B. $(Mg)^{8þ}(O)^{8+}$ C. $(Mg)^{2+}(O)^{2-þ}$ D. $(Mg)^{6+}(O)^{2-þ}$

41. Which is the electron configuration of fluorine?

A. 2,7 B. 1,8 C. 7,2 D. 8,1

42. What happens in covalent bond?

A. Sharing of electron

B. Transfer of electrons

C. Either sharing or transfer of electrons

D. Neither sharing nor transfer electrons

43. Which is an example for covalent bond?

A. Nacl B. Mg_2O C. F_2 D. Na_2O

44. What will be the difference in the electronegativity of the constituent elements of covalent compounds?

A. 2 B. Greater than 2 C. Greater than 1.7 D. Less than 1.7

45. Write an example for double bond

A. F_2 B. O_2 C. Cl_2 D. N_2

46. Which type of ion is $Na^{+?}$

A. Anion B. Positron C. Neutrino D. Cation.

47. How many electrons are needed for carbon atom to complete its octet electron configuration?

A. 4 B. 8 C. 2 D. 3

48. What is the type of bond in carbon tetra chloride?

A. Ionic bond B. Metalic bond C. Magnetic bond D. Covalent bond

49. What is meant by electronegativity?

A. The ability to attract bonding electrons

B. The ability to repel the non bonding electrons

C. The attraction of non bonding electrons

D. The repulsion of bonding electrons

50. Whose electronegativity scale is widely accepted?

A. Newton B. Rutherford C. Edison D. Linus Pauling

51. What is the maximum value of electro negativity?

A. -4 B. 4 C. -1 D. 1

52. Which of the elements has maximum electronegativity?

A. O B. F C. Cl D. C

53. What is the difference in the electro negativity of the constituent elements of the compounds having ionic character?

A. Greater than 1 B. Less than 1 C. Greater than 1.7 D. Less than 1.7

54. Where do the electrons present that take part in chemical reaction?

A. In inner shell B. In Nucleus C. Out side atom D. In outer shell

55. Why does the shared pair of electrons are equally attracted in diatomic molecule?

A. Electronegativity is different B. Electronegativity is equal

C. Charge of nucleus is +ve D. Neutrons are there in nucleus

56. Eventhough the molecular mass is less water is a liquid .Why?

A. Water is not a polar compound B .Water is a polar compound

C. Water is a good solvent D. Water has high surface tension

57. What are the properties of ionic compound?

A. Solid, soluble in water B. solid, insoluble in water.

C. Liquid soluble in water. D. .Liquid insoluble in water.

58. What is the valency of carbon?

A. 1 B. 2 C. 3 D. 4

59. How do we determine the valency of atom?

A. Number of donated Electron

B. Number of accepted electron

C. Number of sharing electron

D. Number of donating or accepting electron.

60. The chemical equation of Aluminium chloride is $AlCl_3$. What is the valency of aluminium?

A. 1 B. 4 C. 2 D. 3

Appendix X

UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

ACHIEVEMENT TEST IN CHEMISTRY

(For Standard IX Pupils)

(DRAFT)

RESPONSE SHEET

Name of the Student :…… Boy/Girl:…….

Name of the School : …….. Rural/Urban:.....

Type of Management: Govt./Private

Sl. No.					Sl. No.				
1.	A	B	C	D	31.	A	B	C	D
2.	A	B	C	D	32.	A	B	C	D
3.	A	B	C	D	33.	A	B	C	D
4.	A	B	C	D	34.	A	B	C	D
5.	A	B	C	D	35.	A	B	C	D
6.	A	B	C	D	36.	A	B	C	D
7.	A	B	C	D	37.	A	B	C	D
8.	A	B	C	D	38.	A	B	C	D
9.	A	B	C	D	39.	A	B	C	D
10.	A	B	C	D	40.	A	B	C	D
11.	A	B	C	D	41.	A	B	C	D
12.	A	B	C	D	42.	A	B	C	D
13.	A	B	C	D	43.	A	B	C	D
14.	A	B	C	D	44.	A	B	C	D
15.	A	B	C	D	45.	A	B	C	D
16.	A	B	C	D	46.	A	B	C	D
17.	A	B	C	D	47.	A	B	C	D
18.	A	B	C	D	48.	A	B	C	D
19.	A	B	C	D	49.	A	B	C	D
20.	A	B	C	D	50.	A	B	C	D
21.	A	B	C	D	51.	A	B	C	D
22.	A	B	C	D	52.	A	B	C	D
23.	A	B	C	D	53.	A	B	C	D
24.	A	B	C	D	54.	A	B	C	D
25.	A	B	C	D	55.	A	B	C	D
26.	A	B	C	D	56.	A	B	C	D
27.	A	B	C	D	57.	A	B	C	D
28.	A	B	C	D	58.	A	B	C	D
29.	A	B	C	D	59.	A	B	C	D
30.	A	B	C	D	60.	A	B	C	D

Appendix XI

UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

ACHIEVEMENT TEST IN CHEMISTRY(Final)

(For Standard IX Pupils)

Dr. C. Naseema
Professor of Education

Gopalakrishnan. P.P
Research Scholar

Marks: 34

നിർദ്ദേശങ്ങൾ

തന്നിരിക്കുന്ന എല്ലാ ചോദ്യങ്ങൾക്കും A, B, C, D എന്നീ ഉത്തരങ്ങൾ കൊടുത്തിരിക്കുന്നു. ഇതിൽ ശരിയുത്തരം മനസ്സിലാക്കി പ്രത്യേകം തരുന്ന ഉത്തരക്കടലാസ്സിൽ ശരിയുത്തരത്തിന് നേരെയുള്ള ചതുരത്തിൽ 'X' എന്ന ചിഹ്നമിട്ട് രേഖപ്പെടുത്തുക.

1. പരമാണു സിദ്ധാന്തം ആദ്യമായി പ്രസ്താവിച്ചതാർ?
   A) ലൂസിപ്പസ് B) അരിസ്റ്റോട്ടിൽ C) കണാദൻ D) ലുക്രീഷ്യസ്
2. മാസ് സംരക്ഷണ നിയമം ആവിഷ്കരിച്ച ശാസ്ത്രജ്ഞൻ ആർ?
   A) ലാവോസിയ B) ന്യൂട്ടൻ C) അരിസ്റ്റോട്ടിൽ D) പ്ലേറ്റോ
3. ഒരു രാസ പ്രവർത്തനത്തിൽ മാസ് -------- ?
   A) നിർമ്മിക്കപ്പെടുന്നു
   B) നശിപ്പിക്കപ്പെടുന്നു.
   C) നിർമ്മിക്കുകയും നശിപ്പിക്കുകയും ചെയ്യുന്നു.
   D) നിർമ്മിക്കുകയും നശിപ്പിക്കുകയും ചെയ്യുന്നില്ല.
4. രാസ സംയോജന നിയമങ്ങൾക്കു വേണ്ടി ആറ്റം സിദ്ധാന്തം അവതരിപ്പിച്ച ബ്രിട്ടീഷ് ശാസ്ത്രജ്ഞൻ ആർ?
   A) ന്യൂട്ടൻ B) ലാവോസിയ C) ജോൺഡാൾഡട്ടൻ D) ലുക്രീഷ്യസ്
5. ഗോൾഡ് ഫോയിലിൽ ആൽഫാ കണം പതിപ്പിച്ച് പരീക്ഷണം നടത്തിയ ശാസ്ത്രജ്ഞൻ ആർ?
   A) തോംസൺ B) ഗോൾഡ് സ്റ്റെയിൻ C) ന്യൂട്ടൻ D) റൂഥർഫോർഡ്
6. ഗോൾഡ് ഫോയിൽ പരീക്ഷണത്തിൽ വളരെ കുറച്ച് ആൽഫകണങ്ങൾ മാത്രം പ്രതിഫലിക്കാൻ കാരണം ---------
   A) ആറ്റത്തിന്റെ ഉള്ളിൽ ഭൂരിഭാഗം സ്ഥലം ശൂന്യമാണ് .
   B) ആറ്റത്തിന്റെ ഉള്ളിൽ ഭൂരിഭാഗം സ്ഥലം ശൂന്യമല്ല .
   C) ആറ്റം എല്ലാ കണങ്ങളേയും കടത്തി വിടുന്നു.
   D) ആറ്റം എല്ലാ കണങ്ങളേയും തടഞ്ഞു വെക്കുന്നു.
7. ആൽഫാ കണത്തിന്റെ ചാർജ് എന്ത്?
   A) +ve B) - ve C) +ve വും - veവും ആണ് D) +ve ഓ - ve ഓ അല്ല.
8. യോജിക്കാത്തത് തിരഞ്ഞെടുത്തെഴുതുക

A) ആറ്റത്തിന് ന്യക്ലിയസ്സ് ഉണ്ട്

B) ആറ്റത്തിനെ അപേക്ഷിച്ച് ന്യുക്ലിയസ്സ് വളരെ ചെറുതാണ്.

C) ന്യൂക്ലിയസ്സിന് ചാർജ് ഇല്ല

D) ഇലക്ട്രോണുകൾ ന്യൂക്ലിയസ്സിനു ചുറ്റും ചലിക്കുന്നു.

9. ആൽഫാ കണങ്ങൾക്ക് എത്രയൂണിറ്റ് ചാർജ് ഉണ്ട് ?

A) 2 യൂണിറ്റ് +ve B) 2 യൂണിറ്റ് - ve C) 4 യൂണിറ്റ് +ve D) 4 യൂണിറ്റ് - ve

10. ബോറിന്റെ ആറ്റം മാതൃകയിൽ ന്യക്ലിയസ്സിൽ നിന്നും അകലം കൂടുന്തോറും ഷെല്ലുകളുടെ ഊർജം ------

A) കുറയുന്നു. B) കുറഞ്ഞും കൂടിയും വരുന്നു.

C) കുറയുന്നോ കൂടുന്നോ ഇല്ല D) കൂടുന്നു.

11. ന്യൂട്രോണുകളുടെ സാന്നിദ്ധ്യം സ്ഥിരീകരിച്ച ശാസ്ത്രജ്ഞൻ ആർ?

A) ചാഡ്വിക്. B) ഐൻസ്റ്റീൻ. C) ഡാർവിൻ D) റൂഥർ ഫോർഡ്.

12. ആറ്റത്തിലെപ്രോട്ടോണുകളുടെ ആകെ എണ്ണത്തെ -------- എന്നുപറയുന്നു?

A) ആറ്റോമിക്മാസ് B) ആറ്റോമികനമ്പർ

C) ആറ്റോമികഘടന D) ആറ്റോമികഭാരം

13. മൗലിക കണങ്ങളല്ലാത്തത് ഏത്?

A) മീസോൺ B) പ്രോട്ടോൺ C) ഇലക്ട്രോൺ D) ന്യൂട്രോൺ

14. മാസ്നമ്പർ - ആറ്റോമികനമ്പർ = --------?

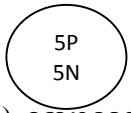
A) പ്രോട്ടോണുകളുടെ എണ്ണം B) ന്യൂട്രോണുകളുടെ എണ്ണം

C) ഇലക്ട്രോണുകളുടെ എണ്ണം D) ന്യൂട്രിനോയുടെ എണ്ണം

15. Na എന്നത് ഏതു മൂലകത്തെ സൂചിപ്പിക്കുന്നു?

A) സോഡിയം B) പൊട്ടാസ്യം C) കാൽസ്യം D) മെഗ്നീഷ്യം

16. താഴെ കൊടുത്തിരിക്കുന്നത് ഏത് മൂലകത്തിന്റെ ന്യൂക്ലിയസ് ആണ്?



A) ഹീലിയം B) ബോറോൺ C) ലിതിയം D ബെറിലിയം

17. K എന്ന ഷെല്ലിൽ ഉൾക്കൊള്ളാവുന്ന പരമാവധി ഇലക്ട്രോണുകളുടെ എണ്ണം.?

A) 2 B) 3 C) 4 D) 5

18. ഡ്യൂട്ടീരിയം ---------- മൂലകത്തിന്റെ ഐസോടോപ്പ് ആകുന്നു?

A) ഹൈഡ്രജൻ B) ഹീലിയം C) സോഡിയം D) കാൽസ്യം

19. ന്യൂക്ലിയസിനു ചുറ്റും ഇലക്ട്രോണുകൾ എവിടെയാണ് ചലിക്കുന്നത് ?

A) നേർരേഖയിൽ B) വർത്തുളമായി C) ഷെല്ലുകളിൽ D) ആറ്റത്തിൽ

20. ന്യൂക്ലിയസ്സിൽ നിന്നുള്ള അകലം കൂടുന്തോറും ഇലക്ട്രോണുകളുടെ ഊർജ ത്തിന് വരുന്ന മാറ്റം എന്ത്?

A) ഊർജംകുറയുന്നു B) ഊർജത്തിന് മാറ്റമില്ല

C) ഊർജം കൂടുന്നു. D) ഊർജം കൂടുകയോ കുറയുകയോ ചെയ്യാം.

21. പ്രോട്ടോണുകളുടെ സാന്നിദ്ധ്യം സ്ഥിരീകരിച്ച ശാസ്ത്രജ്ഞൻ ആർ?

A) മാക്സ് വെൽ B) ബോർ C) റൂഥർഫോർഡ് D) ഒന്നുമല്ല.

22. ഓക്സിജന്റെ ആറ്റോമിക നമ്പർ 8 ആകുന്നു. ബാഹ്യതമഷെല്ലിലെ ഇലക്ട്രോണുകളുടെ എണ്ണം എത്ര?

A) 1 B) 2 C) 8 D) 6

23. സോഡിയം ക്ലോറൈഡ് തന്മാത്രയെ $(Na)^{+}(C)l)^{-}$എന്ന് സൂചിപ്പിക്കാൻ കാരണം?

A) സോഡിയത്തിന് പ്രോട്ടോൺ ലഭിക്കുന്നതു കൊണ്ട്

B) സോഡിയത്തിന് ഇലക്ട്രോൺ നഷ്ടമാവുന്നതു കൊണ്ട്

C) ക്ലോറിന് പ്രോട്ടോൺ ലഭിക്കുന്നതു കൊണ്ട്

D) ക്ലോറിന് പ്രോട്ടോൺ നഷ്ടമാകുന്നതു കൊണ്ട്

24. അയോണിക ബന്ധനത്തിൽ സംഭവിക്കുന്നതെന്ത് ?

A) ഇലക്ട്രോണുകൾ പങ്കിടുന്നു. B) ഇലക്ട്രോൺ കൈമാറ്റം ചെയ്യുന്നു.

C) പ്രോട്ടോൺ പങ്കിടുന്നു. D) പ്രോട്ടോൺ കൈമാറ്റം ചെയ്യുന്നു.

25. അയോണിക ബന്ധനത്തിൽ അയോണുകളെ ചേർത്തു നിർത്തുന്ന ബലം ഏത് ?

A) വിപരീത ചാർജുള്ള അയോണുകളുടെ വൈദ്യുതാഘർഷണ ബലം

B) ഒരേ ചാർജ്ജുള്ള അയോണുകളുടെ വൈദ്യുത വികർഷണ ബലം

C) ഇലക്ട്രോണുകളും ഇലക്ട്രോണുകളും തമ്മിലുള്ള വികർഷണ ബലം

D) തന്മാത്രകൾ തമ്മിലുള്ള ആകർഷണ ബലം

26. ഫ്ളൂറിന്റെ ഇലക്ട്രോൺ വിന്യാസം ഏത് ?

A) 2,7 B) 1,8 C) 7,2 D) 8,1

27. സഹസംയോജക ബന്ധനത്തിൽ സംഭവിക്കുന്നതെന്ത്?

A) ഇലക്ട്രോണുകൾ പങ്കിടുന്നു.

B) ഇലക്ട്രോൺ കൈമാറ്റം ചെയ്യുന്നു.

C) ഇലക്ട്രോണുകൾ പങ്കിടുകയോ കൈമാറ്റം ചെയ്യുകയോ ചെയ്യുന്നു..

D) ഇലക്ട്രോണുകൾ പങ്കിടുകയോ കൈമാറ്റം ചെയ്യുകയോ ചെയ്യുന്നില്ല.

28. സഹ സംയോജക സ്വഭാവമുള്ള സംയുക്തങ്ങളിലെ ഘടക മൂലകങ്ങളുടെ ഇലക്ട്രോ നെഗറ്റിവിറ്റി യിലുള്ള വിത്യാസം എത്ര ?

A) 2 B) 2ൽ കൂടുതൽ C) 1.7 ൽ കൂടുതൽ D) 1.7 ൽ കുറവ്

29. കാർബൺ ടെട്രാക്ലോറൈഡ് തന്മാത്രയിലെ ബന്ധനം ഏതു തരത്തിൽ പെട്ടതാണ്?

A) അയോണികബന്ധനം B) ലോഹീയബന്ധനം

C) കാന്തിക ബന്ധനം D) സഹസംയോജക ബന്ധനം

30. ഇലക്ട്രോ നെഗറ്റിവിറ്റി എന്നാൽ എന്ത് ?

A) ബന്ധിത ഇലക്ട്രോണുകളെ ആകർഷിക്കാനുള്ള കഴിവ്.

B) ബന്ധിതമല്ലാത്ത ഇലക്ട്രോണുകളെ വികർഷിപ്പിക്കാനുള്ള കഴിവ്.

C) ബന്ധിതമല്ലാത്ത ഇലക്ട്രോണുകളുടെ ആകർഷണം

D) ബന്ധിത ഇലക്ട്രോണുകളുടെ വികർഷണം

31. ആരുടെ ഇലക്ട്രോ നെഗറ്റിവിറ്റി സ്കെയിലാണ് കൂടുതൽ പ്രചാരം നേടിയത്?

A) ന്യൂട്ടൻ B) റൂഥർഫോർഡ് C) എഡിസൺ D) ലീനസ് പോളിംഗ്

32. ഇലക്ട്രോ നെഗറ്റിവിറ്റിയുടെ ഏറ്റവും കൂടിയ മൂലകം ഏത് ?

A) O B) F C) Cl D) C

33. അയോണിക സ്വഭാവമുള്ള സംയുക്തങ്ങളിലെ ഘടകമൂലകങ്ങളുടെ ഇലക്ട്രോ നെഗറ്റിവിറ്റി വിലകൾ തമ്മിലുള്ള വിത്യാസം എത്ര ?

A) 1 ൽ കൂടുതൽ B) 1 ൽ കുറവ് C) 1.7 ൽ കൂടുതൽ D) 1.7 ൽ കുറവ്

34. രാസപ്രവർത്തനത്തിൽ പങ്കെടുക്കുന്ന ഇലക്ട്രോണുകൾ എവിടെ സ്ഥിതി ചെയ്യുന്നു.?

A) ആന്തരിക ഷെല്ലിൽ B) ന്യൂക്ലിയസ്സിൽ

C) ആറ്റത്തിന് പുറത്ത് D) ബാഹ്യതമ ഷെല്ലിൽ

Appendix XII

UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

ACHIEVEMENT TEST IN CHEMISTRY (Final)

(For Standard IX Pupils)

Dr. C. Naseema
Professor of Education

Gopalakrishnan. P.P
Research Scholar

Marks: 34

Instructions

Four choices such as A,B,C,D are given for all the following questions. Select the correct answer. Mark 'X' in the box for the correct answer, in the separate answer sheet given.

1. Who put forward the theory of "Paramanu"?
   A. Leucippus B. Aristotle C. Kanada D. Lucretius
2. Who proposed the law of conservation of mass?
   A. Lavoisier B. Newton C. Aristotle D. Plato
3. In a chemical reaction mass is--------
   A. Created B. Destroyed
   C. Created and destroyed D. Neither Created nor destroyed
4. Who introduced atomic theory for explaining laws of chemical reaction?
   A. Newton B. Lavoisier C. John Dalton D. Lucretius
5. Who conducted the gold foil experiments by making alpha particle fall on gold foil?
   A. Thomson B. Gold Stein C. Newton D. Rutherford
6. In the gold foil experiment only a very few alpha particle reflected because -------
   A. Most of the space in an atom is empty.
   B. Most of the space in an atom is not empty.
   C. Atom allows all the particle to pass through
   D. Atom obstructs all the particles
7. What is the charge of alpha particle?
   A. +ve B. –ve C. +ve and –ve D. Either +ve or -ve
8. Select the answer is **not** correct:
   A. Atom has a nucleus B. Compared to the atom nucleus is very small.
   C. Nucleus has no charge D. Electrons are moving around nucleus
9. How many unit of charge is there for an alpha particle?

A. 2 unit +ve B. 2 unit -ve C. 4 unit +ve D. 4 unit –ve

10. In Bohr model of atom what will happen to the energy of the shell when its distance from the nucleus increases?

A. Decreases B. Decrease and increase
C. Neither increase nor decrease D. Increase

11. Who confirmed the presence of Neutrons?

A. Chadwick B. Einstein C. Darwin D. Rutherford

12. The total number of protons in an atom is known as ----------

A. Atomic mass B. Atomic number C. Atomic structure D. Atomic weight

13. Which is not a fundamental particle?

A. Meson B. Proton C. Electron D. Neutron

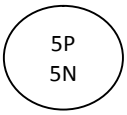
14. Mass number - Atomic number = ----------?

A. Number of protons B. Number of neutrons
C. Number of electrons D. Number of neutrino.

15. Which element is represented by the symbol Na?

A. Sodium B. Potassium C. calcium D. Magnesium

16. The nucleus of which element is given in the figure?



A. Helium B. Boron C. Lithium D. Berlium

17. What is the maximum number of electrons that K shell can contain?

A. 2 B. 3 C. 4 D. 5

18. Deuterium is the isotope of ----------element.

A. Hydrogen B. Helium C. Sodium D. Calcium

19. Where do electrons move around the nucleus?

A. In straight line B. In circular path C. In shell D. In atom

20. What change in the energy of electron does occur as the distance from nucleus increases?

A. Energy decreases B. No change in energy
C. Energy increases D. Energy will either increase or decrease

21. Who confirmed the presence of proton?

A. Maxwell B. Bohr C. Rutherford D. None

22. The atomic number of oxygen is 8. What is the number of electrons in its outermost shell?

A. 1 B. 2 C. 8 D. 6

23. What is the meaning of representing sodium chloride as molecule (Na)+ (Cl) -?

A. Sodium accepts proton B. Sodium donates electron

C. Chlorine accepts Proton D. Chlorine donates proton

24. Which of the following happens in the ionic bond?

A. Electron sharing B. Electron exchanging
C. Proton sharing D. Proton exchanging

25. What is the force that unites the ions in ionic bond?

A. The electrostatic attraction of the ions having opposite charges
B. The electrostatic repulsion of the ions having same charges
C. The repulsive force between electrons
D. The attraction force between molecule

26. Which is the electron configuration of fluorine?

A. 2,7 B. 1,8 C. 7,2 D. 8,1

27. What happens in covalent bond?

A. Sharing of electron B. Transfer of electrons
C. Either sharing or transfer of electrons D. Neither sharing nor transfer electrons

28. What will be the difference in the electro negativity of the constituent elements of covalent compounds?

A. 2 B. Greater than 2 C. Greater than 1.7 D. Less than 1.7

29. What is the type of bond in carbon tetrachloride?

A. Ionic bond B. Metallic bond C. Magnetic bond D. Covalent bond

30. What is meant by electronegativity?

A. The ability to attract bonding electrons
B. The ability to repel the non bonding electrons
C. The attraction of non bonding electrons
D. The repulsion of bonding electrons

31. Whose electro negativity scale is widely accepted?

A. Newton B. Rutherford C. Edison D. Linus Pauling

32. Which of the following elements has maximum electronegativity?

A. O B. F C. Cl D. C

33. What is the difference in the electro negativity of the constituent elements of the compounds having ionic character?

A. Greater than 1 B. Less than 1 C. Greater than 1.7 D. Less than 1.7

34. Where do the electrons that take part in a chemical reaction present?

A. In inner shell B. In Nucleus C. Out side atom D. In outer shell

Appendix XIII

UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

ACHIEVEMENT TEST IN CHEMISTRY

(For Standard IX Pupils)

(FINAL)

RESPONSE SHEET

Name of the Student :…… Boy/Girl:…….

Name of the School : …….. Rural/Urban:.....

Type of Management: Govt./Private

Sl. No.					Sl. No.				
1.	A	B	C	D	18.	A	B	C	D
2.	A	B	C	D	19.	A	B	C	D
3.	A	B	C	D	20.	A	B	C	D
4.	A	B	C	D	21.	A	B	C	D
5.	A	B	C	D	22.	A	B	C	D
6.	A	B	C	D	23.	A	B	C	D
7.	A	B	C	D	24.	A	B	C	D
8.	A	B	C	D	25.	A	B	C	D
9.	A	B	C	D	26.	A	B	C	D
10.	A	B	C	D	27.	A	B	C	D
11.	A	B	C	D	28.	A	B	C	D
12.	A	B	C	D	29.	A	B	C	D
13.	A	B	C	D	30.	A	B	C	D
14.	A	B	C	D	31.	A	B	C	D
15.	A	B	C	D	32.	A	B	C	D
16.	A	B	C	D	33.	A	B	C	D
17.	A	B	C	D	34	A	B	C	D

Appendix XIV

UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

ACHIEVEMENT TEST IN CHEMISTRY

(For Standard IX Pupils)

(FINAL)

Scoring Key

Qn. No.	Key
1.	C
2.	A
3.	D
4.	C
5.	D
6.	A
7.	A
8.	C
9.	A
10.	D
11.	A
12.	B
13.	A
14.	B
15.	A
16.	B
17.	A

Qn. No.	Key
18.	A
19.	C
20.	C
21.	C
22.	D
23.	B
24.	B
25.	A
26.	A
27.	A
28.	D
29.	D
30.	A
31.	D
32.	B
33.	C
34	D

Appendix XV

UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

PROFICIENCY TEST IN ENGLISH (Draft)

Prof. (Dr.) C. Naseema
Professor

Gopalakrishnan. P.P
Research Scholar

Instructions

This is a test to evaluate your proficiency in English and it consists of 50 questions. Each question has 4 answers with index a, b, c, and d. You are requested to select the correct answer and then put a 'x'mark in the rectangle below the correct answer in the separate score sheet given.

Please try to answer all questions. Begin only when the examiner says 'start'. Finish answering all questions within 30 minutes and return the score sheet.

(Question 1-5) Read the following story carefully and answer the questions given below.

Foolish Boy

Once there lived a silly boy. His name was Raju. One day his mother sent him to buy a bird. He bought the bird and put it in his hat. Then he put his hat on his head. When he took his hat off, the bird flew away.

His mother said to him, 'You are a silly boy. When you buy another bird, you must put it in a cage.'

Next day Raju went to buy some rice. He thought of what his mother had said, 'put it in a cage', so he took a cage and put the rice into it. When he got home, his mother asked, 'where is the rice?'

The boy answered, 'I put it in the cage, but it fell out.'

His mother said, 'what a silly boy you are! When you buy rice you must put it in your pocket.'

1. What did the mother expect the boy to bring for the first time?

   a. Hat b. Cage c. rice d. Bird

2. Why did the bird fly away?

   a. He put the bird in his hat b. He took off his hat
   c. He was foolish d. He was silly

3. What advice did the mother give in the case of rice?

a. Put it in hat b. Put it in cage
c. Put it in pocket d. Put it in shelf

4. Why was the boy sent for the second time?

a. To buy rice b. To buy cage c. To buy bird d. To buy hat

5. Why did the boy fail to get appreciation?

a. He was clever b. He was silly
c. He was obedient d. He was faithful

(Questions 6-10) Read the following passage carefully and answer the questions given below.

Historical fiction is my favorite genre, and within that, World War II and the Holocaust are my favorite historical events to read about. It is likely because those are the events that shaped my grandparents' generation and I had a close relationship with my grandparents. It's also a time in history of fascinating extremes, a time when people demonstrated amazing courage and selflessness, but also a time when people were consumed by terrible cruelty and evil.

Here's 14 historical fiction titles, focused on World War II and/or the Holocaust and separated into middle school and high school, that I've recently read and would recommend. Click the title of each to read my full review and ideas for using it in the classroom.

6. What type of fiction does the author like to read?

a. Detective b. Narrative c. Historical d. World War II

7. What was common in peoples' character during Holocaust ?

a. Sympathy b. Cruelty c. Empathy d. Kindness

8. Which of the factor did influence human generation?

a. World War II b. Holocaust
c. History d. Cruelty and evil

9. What will we do to get the authors full review ?

a. Click b. Read c. Write d. Use

10. How many books does the author suggest for schools?

a. Fourteen b. Two c. Twenty-eight d. Eight

(Questions 11-15) Read the following poem carefully and answer the questions given below.

Fable

The mountain and the squirrel
Had a quarrel;
And the former called the latter, "little prig."
Bun replied,
"You are doubtless very big;
But all sorts of things and weather
Must be taken in together
To make up a year
And a sphere.
And I think it's no disgrace
To occupy my place.
If I'm not so large as you,
You are so small as I,
And not half so spry.
I'll not deny you make
A very pretty squirrel track;
Talents differ: all is well and wisely put;
If I cannot carry forests on my back,
Neither can you crack a nut."

---

11. Who called whom "little prig"?
    a. Squirrel b. Mountain c. Both d. Bun
12. Who is Bun?
    a. Former b. Mountain c. Squirrel d. Both
13. About what fact does the squirrel have no doubt?
    a. Size b. Weather c. Year d. Sphere
14. How does the characters in the poem differ?
    a. In size b. In talents c. In size and talents d. In beauty
15. Who makes the track?
    a. Squirrel b. Former c. Forest d. Mountain

(Questions 16-21) Choose the option nearest in meaning from the options given.

16. Splendid
    a. Grand b. huge c. Average d. Big
17. Valor
    a. Cowardice b. Courage c. Pride d. Envy
18. Terrible
    a. Pleasant b. Beautiful c. fearful d. Calm
19. Enormous
    a. Little b. Small c. Low d. Vast
20. Despair
    a. Hopefulness b. Hopelessness c. Optimism d. Violence

Questions (21-25) Choose the correct option to fill in the blanks.

21. All of us ------- a sigh of relief when the strife stopped.
    a. clapped b. jumped c. waved d. heaved
22. Cat's eyes ------- in the darkness.
    a. twisted b. gleamed c. closed d. shut
23. To be weak is -------- in doing or suffering.
    a. painless b. delightful c. miserable d. strange
24. The accident was a ---------- sight.
    a. pleasant b. nice c. dreadful d. appreciable
25. The plane was ---------- for 5 p.m.
    a. scheduled b. arranged c. set d. mentioned

(Questions 26-30) Choose the correct option to fill in the blanks.

26. He can work ------ in the morning than in the evening.
    a. more hard b. much hard c. harder d. hardest
27. Sun ------ in the east.
    a. will rise b. rose c. would rise d. rises
28. As soon the police arrived the thieves -------
    a. leave b. left c. was left d. had left
29. I ----- Hindi for seven years.
    a. have been studying b. am studying
    c. was studying d. study.
30. She failed ------ she had not studied.
    a. hence b. because c. and d. or
31. He tells the truth, ------ he?
    a. is b. do c. doesn't d. does
32. Penicillin gives protection ----- infection.
    a. against b. with c. for d. at
33. If she ----- a bird she would fly.
    a. was b. were c. is d. be
34 If he had invited me, I -------attended the wedding.
    a. would have b. have c. will attend d. attend
35. The boy ------- I had lent the book is absent.
    a. to which b. to who c. to where d. to whom

(Questions 36-40) Read the following and fill the blanks with appropriate connectives.

Alex got up early -----36 went to the fields ------37 he went to school . -------38 having a cup of tea he went to the bathroom. -------39 there was no hot water he made no complaint. -----40 he used the cold water.

36. a. however b. and c. but d. as well as

37. a. after b. as well as c. although d. before

38. a. Though b. After c. And d. Although

39. a. But b. Although c. Later d. So

40. a. Instead b. Hence c. So d. Before

(Questions 41-50) Read the following passage carefully before filling the blanks. Select the most appropriate option from the ones given to complete each blank.

The sun and its planets ---41 the solar system. The word 'solar'means belonging to the sun. we cannot live ----42 the heat and light that the sun gives us. In fact all the planets of the solar system ----43 the sun for heat and light. They shine only in the reflected light ---44 sun.

The planets of the solar system are not at all the ---45. The ones ---46 to the sun, naturally, have a higher temperature than those farther away. The ----47 the planets are from the sun the longer it takes to travel ----48 the sun. The planets are of different sizes ……49. Jupiter is the largest planet and Mercury -----50.

41. a. is called b. are seen c. are called d. are seen

42. a. with b. within c. into d. without

43. a. depended on b. depend on c. depend for d. depended in

44. a. of the b. on the c. at the d. in the

45. a. different b. equal c. vary d. same

46. a. farther b. longer c. closer d. remote

47. a. farther b. further c. broader d. wider

48. a. round about b. round c. around d. to

49. a. as well b. at all c. may be d. can be

50. a. small b. short c. shortest d. smallest.

Appendix XVI

UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

PROFICIENCY TEST IN ENGLISH (Draft)

RESPONSE SHEET

Name of the Student :…….....…… Boy/Girl:…….....….....

Name of the School : ……..... Rural/Urban:.....

Type of Management: Govt./Private

Sl. No.				
1.	a	b	c	d
2.	a	b	c	d
3.	a	b	c	d
4.	a	b	c	d
5.	a	b	c	d
6.	a	b	c	d
7.	a	b	c	d
8.	a	b	c	d
9.	a	b	c	d
10.	a	b	c	d
11.	a	b	c	d
12.	a	b	c	d
13.	a	b	c	d
14.	a	b	c	d
15.	a	b	c	d
16.	a	b	c	d
17.	a	b	c	d
18.	a	b	c	d
19.	a	b	c	d
20.	a	b	c	d
21.	a	b	c	d
22.	a	b	c	d
23.	a	b	c	d
24.	a	b	c	d
25.	a	b	c	d

Sl. No.				
26.	a	b	c	d
27.	a	b	c	d
28.	a	b	c	d
29.	a	b	c	d
30.	a	b	c	d
31.	a	b	c	d
32.	a	b	c	d
33.	a	b	c	d
34.	a	b	c	d
35.	a	b	c	d
36.	a	b	c	d
37.	a	b	c	d
38.	a	b	c	d
39.	a	b	c	d
40.	a	b	c	d
41.	a	b	c	d
42.	a	b	c	d
43.	a	b	c	d
44.	a	b	c	d
45.	a	b	c	d
46.	a	b	c	d
47.	a	b	c	d
48.	a	b	c	d
49.	a	b	c	d
50.	a	b	c	d

Appendix XVII

UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

PROFICIENCY TEST IN ENGLISH (Final)

Prof. (Dr.) **C. Naseema**
Professor

Gopalakrishnan. P.P
Research Scholar

Instructions

This is a test to evaluate your proficiency in English and it consists of 50 questions. Each question has 4 answers with index a, b, c, and d. You are requested to select the correct answer and then put a 'x 'mark in the rectangle below the correct answer in the separate score sheet given.

Please try to answer all questions. Begin only when the examiner says 'start'. Finish answering all questions within 30 minutes and return the score sheet.

(Question 1-5) Read the following story carefully and answer the questions given below.

Foolish Boy

Once there lived a silly boy. His name was Raju. One day his mother sent him to buy a bird. He bought the bird and put it in his hat. Then he put his hat on his head. When he took his hat off, the bird flew away.

His mother said to him, 'You are a silly boy. When you buy another bird, you must put it in a cage.'

Next day Raju went to buy some rice. He thought of what his mother had said, 'put it in a cage', so he took a cage and put the rice into it. When he got home, his mother asked, 'where is the rice?'

The boy answered, 'I put it in the cage, but it fell out.'

His mother said, 'what a silly boy you are! When you buy rice you must put it in your pocket.'

1. What did the mother expect the boy to bring for the first time?

   a. Hat b. Cage c. rice d. Bird

2. Why did the bird fly away?

a. He put the bird in his hat b. He took off his hat
c. He was foolish d. He was silly

3. What advice did the mother give in the case of rice?

a. Put it in hat b. Put it in cage
c. Put it in pocket d. Put it in shelf

4. Why was the boy sent for the second time?

a. To buy rice b. To buy cage
c. To buy bird d. To buy hat

5. Why did the boy fail to get appreciation ?

a. He was clever b. He was silly
c. He was obedient d. He was faithful

(Questions 6-10) Read the following passage carefully and answer the questions given below.

Historical fiction is my favorite genre, and within that, World War II and the Holocaust are my favorite historical events to read about. It is likely because those are the events that shaped my grandparents' generation and I had a close relationship with my grandparents. It's also a time in history of fascinating extremes, a time when people demonstrated amazing courage and selflessness, but also a time when people were consumed by terrible cruelty and evil.

Here's 14 historical fiction titles, focused on World War II and/or the Holocaust and separated into middle school and high school, that I've recently read and would recommend. Click the title of each to read my full review and ideas for using it in the classroom.

6. What type of fiction does the author like to read?

a. Detective b. Narrative
c. Historical d. World War II

7. What was common in peoples' character during Holocaust ?

a. Sympathy b. Cruelty c. Empathy d. Kindness

8. What will we do to get the authors full review ?

a. Click b. Read c. Write d. Use

9. How many books does the author suggest for schools?

a. Fourteen b. Two c. Twenty-eight d. Eight

(Questions 10-12) Read the following poem carefully and answer the questions given below.

Fable

The mountain and the squirrel
Had a quarrel;
And the former called the latter, "little prig."
Bun replied,
"You are doubtless very big;
But all sorts of things and weather
Must be taken in together
To make up a year
And a sphere.
And I think it's no disgrace
To occupy my place.
If I'm not so large as you,
You are so small as I,
And not half so spry.
I'll not deny you make
A very pretty squirrel track;
Talents differ: all is well and wisely put;
If I cannot carry forests on my back,
Neither can you crack a nut."

---

10. About what fact does the squirrel have no doubt?
    a. Size b. Weather c. Year d. Sphere
11. How does the characters in the poem differ?
    a. In size b. In talents c. In size and talents d. In beauty
12. Who makes the track?
    a. Squirrel b. Former c. Forest d. Mountain

(Questions 13-16) Choose the option nearest in meaning from the options given.

13. Splendid
    a. Grand b. huge c. Average d. Big
14. Valor
    a. Cowardice b. Courage c. Pride d. Envy
15. Terrible
    a. Pleasant b. Beautiful c. fearful d. Calm
16. Enormous
    a. Little b. Small c. Low d. Vast

Questions (17-18) Choose the correct option to fill in the blanks.

17. Cat's eyes ------- in the darkness.
    a. twisted b. gleamed c. closed d. shut
18. The accident was a ---------- sight.
    a. pleasant b. nice c. dreadful d. appreciable

(Questions 19-22) Choose the correct option to fill in the blanks.

19. He tells the truth, ------ he?
    a. is b. do c. doesn't d. does
20. Penicillin gives protection ----- infection.
    a. against b. with c. for d. at
21 If he had invited me, I -------attended the wedding.
    a. would have b. have c. will attend d. attend
22. The boy ------- I had lent the book is absent.
    a. to which b. to who c. to where d. to whom

(Questions 23-24) Read the following and fill the blanks with appropriate connectives.

Alex got up early -----23went to the fields before he went to school . -------24 having a cup of tea he went to the bathroom. Although there was no hot water he made no complaint. instead he used the cold water.

23. a. however b. and c. but d. as well as
24. a. though b. after c. and d. although

(Questions 25-32) Read the following passage carefully before filling the blanks. Select the most appropriate option from the ones given to complete each blank.

The sun and its planets ---25 the solar system. The word 'solar' means belonging to the sun. we cannot live ----26 the heat and light that the sun gives us. In fact all the planets of the solar system ----27 the sun for heat and light. They shine only in the reflected light ---28 sun.

The planets of the solar system are not at all the ---29. The ones closer to the sun, naturally, have a higher temperature than those farther away. The farther the planets are from the sun the longer it takes to travel ----30 the sun. The planets are of different sizes ……31. Jupiter is the largest planet and Mercury -----32.

25. a. is called b. are seen c. are called d. are seen
26. a. with b. within c. into d. without
27. a. depended on b. depend on c. depend for d. depended in
28. a. of the b. on the c. at the d. in the
29. a. different b. equal c. vary d. same
30. a. round about b. round c. around d. to
31 a. as well b. at all c. may be d. can be
32. a. small b. short c. shortest d. smallest.

Appendix XVIII

UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

PROFICIENCY TEST IN ENGLISH (Final)

RESPONSE SHEET

Name of the Student :…….....…… Boy/Girl:…….....…….....

Name of the School : ……..... Rural/Urban:.....

Type of Management: Govt./Private

Sl. No.				
1	a	b	c	d
2	a	b	c	d
3	a	b	c	d
4	a	b	c	d
5	a	b	c	d
6	a	b	c	d
7	a	b	c	d
8	a	b	c	d
9	a	b	c	d
10	a	b	c	d
11	a	b	c	d
12	a	b	c	d
13	a	b	c	d
14	a	b	c	d
15	a	b	c	d
16	a	b	c	d

Sl. No.				
17	a	b	c	d
18	a	b	c	d
19	a	b	c	d
20	a	b	c	d
21	a	b	c	d
22	a	b	c	d
23	a	b	c	d
24	a	b	c	d
25	a	b	c	d
26	a	b	c	d
27	a	b	c	d
28	a	b	c	d
29	a	b	c	d
30	a	b	c	d
31	a	b	c	d
32	a	b	c	d

Appendix XIX

UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

PROFICIENCY TEST IN ENGLISH (Final)

Scoring Key

Qn. No.	Key
1	d
2	b
3	c
4	a
5	b
6	c
7	b
8	a
9	a
10	a
11	c
12	a
13	a
14	b
15	c
16	d

Qn. No.	Key
17	b
18	c
19	c
20	a
21	a
22	d
23	b
24	d
25	c
26	d
27	b
28	a
29	d
30	c
31	a
32	d

Appendix XX

UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

SOCIO ECONOMIC STATUS SCALE

Prof. (Dr.) C. Naseema — Professor
Gopalakrishnan. P.P — Research Scholar

Instructions:

This is to collect your personal details for research purpose. Give the details of your family members as correct as possible.

1. Name :…….....….....2. Gender:….....
3. Age:…….....…/Date of Birth: ..... 4. Religion :…….....
5. Caste: ……..... 6. No. of elder brothers and sisters :…….....
7. No. of younger brothers and sisters:…..... 8. Are you differently abled …….....
9. Name of the school/ Standard & Division:…….....
10. Place where school is situated: (Panchayath /Municipality/Corporation)

Details of family members(mark details by "X")

A	Parental Education	Father/Guardian	Mother
	Illiterate		
	Primary Education		
	High School/Higher Secondary Education/ITI, etc.		
	T.T.C, Diploma, etc.		
	BA, B.Sc., B.Com., B.B.A, B.Ed. (Any Degree)		
	MA, M.Sc., M.Com., MBA, M.Ed. (Any P.G)		
	B.Tech, Degree in Medicine(MBBS, BAMS, BHMS, etc.)		
	M.D, Ph.D., etc.		

B	Parental Occupation	Father/Guardian	Mother
	Unemployed		
	Unskilled		
	Semi skilled/Farmer below 50 cent land ownership/ Individual business		
	Skilled/ Farmer below 2 Acres land ownership/ Business with 10 to 20 employees.		
	Semi Professional/ Farmer below 15 Acres land ownership/ Business with 10 to 20 employees		
	Highly Professional/ Farmer above 15 Acres land ownership/ High level business.		

C	Whether any of the parent is suffering from serious illness such as cancer , heart disease, kidney problem etc.	Yes	No

D	Parental Income			
	below 5000		50,001-70,000	
	5001-10,000		70,001-90,000	
	10,001-30,000		Above 90,001	
	30,001-50,000			

Appendix XXI

UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

QUESTIONNAIRE ON PARENTAL SUPPORT

Prof. Dr. C. Naseema
Professor

Gopalakrishnan. P.P.
Research Scholar

Instructions:

This is a questionnaire to know how much your parents help and encourage you to study physical science. There are 32 questions.

Read every question carefully and if your answer is 'yes' put a 'x' mark under the column 'Yes', if you are uncertain, put a 'x' mark under the column 'Don't know' and if your answer is 'No' put a 'x' mark under the column 'No' in the separate score sheet given. Try to respond to all items. To change the incorrect answer put a "0" around it and mark the right answer with a 'x' mark.

---

1. Do your parents give regular attention in your physical science learning?
2. Are your parents interested in clearing your doubts in physical science?
3. Do your parents take time and effort to teach you the difficult portion in physical science?
4. Do your parents often correct your physical science workbook?
5. Do your Parents inform you about the recent developments in physical science?
6. Do your parents consciously avoid entertainment programmes in T.V. while you study?
7. Do your parents find time to clear your doubts in physical science though they are engaged in other works?
8. Do your parents encourage you to do your homework in physical science by yourself?
9. Do your parents want you to notice recent developments in physical science through books, news papers, internet, and programmes in T.V?
10. Do your parents help you to get books, CDs, magazines, internet etc to facilitate physical science learning?
11. Do your parents wish you to obtain high marks in physics and chemistry examinations?
12. Do your Parents advise you about the importance of science quiz competitions and science talent tests or science fairs?
13. Do your parents enquire and inform you about the science quiz programs and talent tests or science fairs?

14. Do your parents help you to take part in science talent tests and quiz competitions etc.?
15. Do your parents give much importance in your physical science learning?
16. Do your parents always compare your marks in physical science with that of your peers?
17. Do your parents blame you when your marks in physical science are low?
18. Do your parents always encourage you to study physical science?
19. Are your parents interested to bring you materials necessary for simple physical science experiments?
20. Do your parents watch patiently when you do experiments related to physical science at home?
21. Are your parents ready to arrange tuition for physical science if you feel any difficulty?
22. Do your parents wish that you will get good jobs through your physical science education?
23. Are your parents very much interested in your physical science achievements?
24. Do your parents like you to be present in all of your physical science classes?
25. Do your parents often come to your school to know your performance in physical science?
26. Do your parents insist you to avoid the common mistakes that you commit in your physical science examinations?
27. Do your parents appreciate you when you get good marks in physical science?
28. Do your parents often offer you presents for your achievements in physical science?
29. Do your parents wish that you get good achievements in physical science competitions?
30. Do your parents often tell you the life histories and stories of eminent scientists?
31. Do your parents always help you to overcome any difficulty that you feel in physical science subject?
32. Do parents wish that you may help others through your knowledge in physical science?

Appendix XXII

UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

QUESTIONNAIRE ON PARENTAL SUPPORT

Dr. C. Naseema
Professor of Education

Gopalakrishnan. P.P
Research Scholar

നിർദ്ദേശങ്ങൾ

ഫിസിക്സ്, കെമിസ്ട്രി വിഷയങ്ങൾ പഠിക്കുന്നതിന് മാതാപിതാക്കൾ നിങ്ങളെ എത്രമാത്രം സഹായിക്കുകയും പലരീതികളിൽ പ്രോത്സാഹിപ്പിക്കുകയും ചെയ്യുന്നു എന്ന് അറിയുന്നതിനുള്ള ഒരു ചോദ്യാവലിയാണിത്. ഇതിന് വേണ്ടിയുള്ള 32 പ്രസ്താവ നകളാണ് താഴെ തന്നിരിക്കുന്നത്.

ഓരോ പ്രസ്താവനയും വായിച്ച് നിങ്ങൾ അതിനോട് യോജിക്കുന്നുണ്ടെങ്കിൽ യോജിക്കുന്നു എന്ന കോളത്തിനടിയിലെ ബ്രാക്കറ്റിനകത്തും, യോജിക്കുന്നില്ലെങ്കിൽ വിയോജിക്കുന്നു എന്ന കോളത്തിനടിയിലെ ബ്രാക്കറ്റിനകത്തും, തീർച്ചയില്ലെങ്കിൽ തീർച്ചയില്ല എന്ന കോളത്തിനടിയിലെ ബ്രോക്കറ്റിനകത്തും 'x' എന്ന ചിഹ്നംകൊണ്ട് ഇതോടൊപ്പം തരുന്ന പ്രത്യേക ഉത്തരക്കടലാസിൽ അടയാളപ്പെടുത്തുക. എല്ലാ പ്രസ്താവനകൾക്കും പ്രതികരണം രേഖപ്പെടുത്തണം. ഒരിക്കൽ രേഖപ്പെടുത്തിയത് മാറ്റ ണമെങ്കിൽ ആദ്യം രേഖപ്പെടുത്തിയ ഉത്തരത്തിനുചുറ്റും '☐' എന്ന അടയാളമിട്ട് ശരിയാ യിട്ടുള്ള ഉത്തരം 'x' എന്ന ചിഹ്നമിട്ട് രേഖപ്പെടുത്തുക.

---

1. എന്റെ മാതാപിതാക്കൾ ഞാൻ ഫിസിക്കൽ സയൻസ് പഠിക്കുന്നത് പതിവായി ശ്രദ്ധി ക്കാറുണ്ട്.
2. ഫിസിക്കൽ സയൻസിലെ എന്റെ സംശയങ്ങൾ തീർത്ത് തരുവാൻ മാതാപിതാക്കൾ താല്പര്യം കാണിക്കാറുണ്ട്.
3. ഫിസിക്കൽസയൻസിലെ പ്രയാസമുള്ള പാഠഭാഗങ്ങൾ പഠിപ്പിക്കുവാൻ എന്റെ മാതാ പിതാക്കൾ അവരുടെ സമയവും പ്രയത്നവും ഉപയോഗിക്കാറുണ്ട്.
4. മതാപിതാക്കൾ പലപ്പോഴും എന്റെ ഫിസിക്കൽ സയൻസ് നോട്ടുബുക്കുകൾ പരി ശോധിച്ച് തെറ്റുകൾ തിരുത്തിതരാറുണ്ട്.
5. ഫിസിക്കൽ സയൻസിലെ ഇപ്പോഴത്തെ വളർച്ചയെക്കുറിച്ച് മതാപിതാക്കൾ എന്നെ ബോധ്യപ്പെടുത്താറുണ്ട്.
6. ഞാൻ പഠിക്കുന്ന അവസരത്തിൽ മാതാപിതാക്കൾ ടി.വിയിലെ വിനോദപരിപാടി കൾ ബോധപൂർവ്വം ഒഴിവാക്കാറുണ്ട്.
7. മതാപിതാക്കൾ മറ്റുള്ള ജോലി ചെയ്യുന്ന അവസരത്തിലും ഫിസിക്കൽസയൻസി ലുള്ള എന്റെ സംശയങ്ങൾ തീർത്തുതരുവാൻ സമയം കണ്ടെത്താറുണ്ട്.

8. ഫിസിക്കൽ സയൻസിലെ ഹോംവർക്കുകൾ സ്വയം ചെയ്യുവാൻ മാതാപിതാക്കൾ പ്രചോദനം നല്കാറുണ്ട്.
9. പുസ്തകങ്ങൾ, പത്രങ്ങൾ, ഇന്റർനെറ്റ്, ടി.വി. പ്രോഗ്രാം എന്നിവയിൽനിന്ന് ഫിസിക്കൽ സയൻസിലെ പുതിയ വളർച്ചയെക്കുറിച്ച് നിരീക്ഷിക്കുവാൻ മതാപിതാക്കൾ എന്നോട് ആവശ്യപ്പെടാറുണ്ട്.
10. ഫിസിക്കൽസയൻസ് പഠിക്കുന്നതിന് പ്രോത്സാഹനമായി ബുക്കുകൾ, സി.ഡി.കൾ, മാസികകൾ, ഇന്റർനെറ്റ് മുതലയാവ എനിക്ക് ലഭ്യമാക്കുന്നതിന് മാതാപിതാക്കൾ എന്നെ സഹായിക്കാറുണ്ട്.
11. ഫിസിക്സിലും കെമിസ്ട്രിയിലും എനിക്ക് ഉയർന്ന മാർക്ക് ലഭിക്കുന്നത് മാതാപിതാക്കൾ ഇഷ്ടപ്പെടുന്നു.
12. സയൻസ് ക്വിസ്മത്സരത്തിന്റെയും സയൻസ് ടാലന്റ് ടെസ്റ്റിന്റെയും പ്രാധാന്യത്തെക്കുറിച്ച് എന്നെ മാതാപിതാക്കൾ ഉപദേശിക്കാറുണ്ട്.
13. മതാപിതാക്കൾ സയൻസ് ക്വിസ് പ്രോഗ്രാം, സയൻസ് ടാലന്റ് ടെസ്റ്റ് എന്നിവയെക്കുറിച്ച് അന്വേഷിച്ച് എനിക്ക് വിവരം നല്കാറുണ്ട്.
14. സയൻസ് ക്വിസ് പ്രോഗ്രമിലും സയൻസ് ടാലന്റ് ടെസ്റ്റിനും പങ്കെടുക്കുന്നതിന് മതാപിതാക്കൾ എന്നെ സാഹയിക്കാറുണ്ട്.
15. എന്റെ ഫിസിക്കൽസയൻസ് പഠനത്തിന് മതാപിതാക്കൾ കൂടുതൽ പ്രധാന്യം നല്കാറുണ്ട്.
16. മാതാപിതാക്കൾ എന്റെ ഫിസിക്കൽസയൻസിലെ മാർക്കുകൾ എന്റെ സഹപാഠികളുടെ മാർക്കുകളുമായി എപ്പോഴും താരതമ്യം ചെയ്യാറുണ്ട്.
17. എനിക്ക് ഫിസിക്കൽസയൻസിൽ മാർക്ക് കുറഞ്ഞുപോയാൽ മതാപിതാക്കൾ എന്നെ കുറ്റം പറയാറില്ല.
18. ഫിസിക്കൽ സയൻസ് പഠിക്കുവാൻ എന്റെ മാതാപിതാക്കൾ എപ്പോഴും എന്നെ പ്രോത്സാഹിപ്പിക്കാറുണ്ട്.
19. ലളിതമായ ഫിസിക്കൽസയൻസ് പരീക്ഷണങ്ങൾക്ക് ആവശ്യമായ ഉപകരണങ്ങൾ എത്തിച്ചുതരുവാൻ എന്റെ മാതാപിതാക്കൾക്ക് താല്പര്യമാണ്.
20. ഞാൻ വീട്ടിൽവെച്ച് പരീക്ഷണങ്ങൾ ചെയ്യുമ്പോൾ മാതാപിതാക്കൾ അത് ക്ഷമയോടെ നിരീക്ഷിക്കാറുണ്ട്.
21. എനിക്ക് ഫിസിക്കൽ സയൻസിൽ എന്തെങ്കിലും ബുദ്ധിമുട്ടുതോന്നുകയാണെങ്കിൽ ട്യൂഷൻ ഏർപ്പാടുചെയ്യുവാൻ എന്റെ മതാപിതാക്കൾ തയ്യാറാണ്.
22. ഫിസിക്കൽസയൻസ് പഠിക്കുന്നതിലൂടെ എനിക്ക് നല്ലൊരു ജോലി ലഭിക്കുവാൻ മതാപിതാക്കൾ ആഗ്രഹിക്കുന്നു.
23. ഫിസിക്കൽ സയൻസിലുള്ള എന്റെ നേട്ടങ്ങളിൽ മതാപിതാക്കൾക്ക് വളരെ താല്പര്യമുണ്ട്.
24. ഞാൻ ഏതൊരു ഫിസിക്കൽസയൻസ് ക്ലാസുകളിൽ നിന്നും വിട്ടുനില്ക്കുന്നത് മതാപിതാക്കൾ ഇഷ്ടപ്പെടുന്നില്ല.

25. ഫിസിക്കൽ സയൻസിലെ എന്റെ നിലവാരം അറിയുന്നതിന് മതാപിതാക്കൾ ഇട യ്ക്കിടെ സ്കൂളിൽ വരാറുണ്ട്.
26. ഫിസിക്കൽ സയൻസ് പരീക്ഷക്ക് ഞാൻ വരുത്തുന്ന തെറ്റുകളെ തിരുത്തുവാൻ മതാ പിതാക്കൾ നിർബന്ധിക്കാറുണ്ട്.
27. ഫിസിക്കൽ സയൻസിൽ നല്ല മാർക്ക് ലഭിക്കുമ്പോൾ എന്നെ മാതാപിതാക്കൾ അഭി നന്ദിക്കാറുണ്ട്.
28. ഫിസിക്കൽ സയൻസിലുള്ള എന്റെ താരതമ്യേന നല്ല നേട്ടങ്ങൾക്ക് മതാപിതാക്കൾ പലപ്പോഴും എനിക്ക് സമ്മാനങ്ങൾ വാഗ്ദാനം ചെയ്യാറുണ്ട്.
29. ഫിസിക്കൽ സയൻസിൽ എനിക്ക് നല്ല നേട്ടങ്ങൾ ഉണ്ടാകണമെന്ന് മതാപിതാക്കൾ ആഗ്രഹിക്കുന്നു.
30. മഹാന്മാരായ ശാസ്ത്രജ്ഞന്മാരുടെ ജീവചരിത്രവും കഥകളും മതാപിതാക്കൾ ഇട യ്ക്കിടെ എനിക്ക് പറഞ്ഞു തരാറുണ്ട്.
31. ഫിസിക്കൽ സയൻസ് വിഷയത്തിൽ എന്റെ ബുദ്ധിമുട്ടുകൾ തരണം ചെയ്യുവാൻ എന്റെ മാതാപിതാക്കൽ എല്ലായ്പ്പോഴും എന്നെ സഹായിക്കാറുണ്ട്.
32. ഫിസിക്കൽ സയൻസിലുള്ള എന്റെ അറിവിലൂടെ മറ്റുള്ളവരെ സഹായിക്കാമെന്ന് മാതാപിതാക്കൾ ആഗ്രഹിക്കുന്നു.

Appendix XXIII

UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

QUESTIONNAIRE ON PARENTAL SUPPORT

RESPONSE SHEET

Name of the Student :…… Boy/Girl:…….

Name of the School : …….. Rural/Urban:.....

Type of Management: Govt./Private

Sl. No.	Agree	Undecided	Disagree
1.			
2.			
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17.			

Sl. No.	Agree	Undecided	Disagree
17.			
18.			
19.			
20.			
21.			
22.			
23.			
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27.			
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