

**THIRD SEMESTER M.A./M.Sc./M.Com. DEGREE (REGULAR)
EXAMINATION, NOVEMBER 2020**

(CBCSS)

Computer Science

CSS 3E 02 F—DATA WAREHOUSING AND MINING

(2019 Admissions)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend all questions in each Section / Part.*
2. *The minimum number of questions to be attended from the Section / Part shall remain same.*
3. *There will be an overall ceiling for each Section / Part that is equivalent to maximum weightage of the Section / Part.*

Section A

Answer any four questions.

Each question carries 2 weightage.

1. Define Data ware housing.
2. In which situation the multidimensional data models are used ?
3. What are the major differences between classification and clustering ?
4. List two applications of data mining.
5. What is a frequent item set ?
6. List the applications of text mining.
7. What do you mean by association rule mining ?

(4 × 2 = 8 weightage)

Section B

Answer any four questions.

Each question carries 3 weightage.

8. Differentiate OLAP, ROLAP and HOLAP.
9. Write a short note on the data mining functionalities.

Turn over

10. What is the social impact of data mining ?
11. What is the significance of correlation analysis ?
12. Explain any two applications of spatial data mining.
13. Explain how the accuracy of a classifier is evaluated.
14. What is information gain ? How it calculated in decision tree based classification?

(4 × 3 = 12 weightage)

Section C

Answer any two questions.

Each question carries 5 weightage.

15. Explain the multi-tier architecture of a data warehouse ? Include proper diagrams in your explanation.
16. Explain the Bayesian classifier with a proper example.
17. Discuss the activities of data cleaning with the process associated with it.
18. How Support Vector Machines is applied for the classification of both linear and non-linear data ?

(2 × 5 = 10 weightage)

**THIRD SEMESTER M.A./M.Sc./M.Com. DEGREE (REGULAR) EXAMINATION
NOVEMBER 2020****(CBCSS)****Computer Science****CSS 3E 02 (E)—VIRTUALIZATION AND CLOUD COMPUTING****(2019 Admissions)****Time : Three Hours****Maximum : 30 Weightage****General Instructions**

1. *In cases where choices are provided, students can attend all questions in each Section / Part.*
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Section A*Answer any four questions.**Each question carries 2 weightage.*

1. State the advantages of cloud service deployment.
2. List the drawbacks of parallel and distributed paradigms.
3. Define virtual machine security.
4. What is thin client ?
5. What you mean by desktop virtualization ?
6. What is a Private cloud ?
7. What do you mean by distributed file system ?

(4 × 2 = 8 weightage)**Section B***Answer any four questions.**Each question carries 3 weightage.*

8. Write a short note on the risks of storing data in a cloud.
9. Explain the term "security" in a hybrid cloud.

10. State and explain the benefits of cloud computing.
11. Write a short note on Apache in cloud computing.
12. What do you mean by security governance?
13. Write a short note on mapping applications.
14. Write the significance of parallel processing with a simple example.

(2 x 4 = 8) (weightage)

Section C

Answer any two questions
Each question carries 8 marks

15. What do you mean by virtualization and types of mechanisms available for virtualization?
16. Discuss the operational and economic benefits of SaaS.
17. Explain the HDFS Architecture in detail.
18. Illustrate about Hadoop Map Reduce frame work.

(2 x 4 = 8) (weightage)

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**THIRD SEMESTER M.A./M.Sc./M.Com. DEGREE (REGULAR) EXAMINATION
NOVEMBER 2020**

(CBCSS)

Computer Science

CSS 3E 02 D—ADVANCED WEB TECHNOLOGY

(2019 Admissions)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend all questions in each Section/Part.*
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Section A

Answer any four questions.

Each question carries 2 weightage.

1. What is Client side technology ?
2. Give a note on ExtJS.
3. Write down the behavioral characteristics of Web services.
4. Define Queues.
5. Give a note on Apache Web server.
6. Write syntax and give suitable example for UPDATE command.
7. Write about selection query using python.

(4 × 2 = 8 weightage)

Section B

Answer any four questions.

Each question carries 3 weightage.

8. Write about the server side technology Microsoft .Net framework.
9. Describe about authentication.

Turn over

10. What is web service confidentiality ? Explain.
11. Illustrate user defined exception.
12. Explain the concept of validating a data.
13. Design a customer registration form for online seminar using python.
14. Explain XML parser.

(4 × 3 = 12 weightage)

Section C

Answer any two questions.

Each question carries 5 weightage.

15. Explain in detail about Web oriented architecture.
16. Write about the concept SOAP security extensions.
17. Discuss Exception handling in python with example.
18. Elaborate the process of developing python server side pages with example.

(2 × 5 = 10 weightage)

**THIRD SEMESTER M.A./M.Sc./M.Com. DEGREE (REGULAR)
EXAMINATION, NOVEMBER 2020**

(CBCSS)

Computer Science

CSS 3E 02 C—CRYPTOGRAPHY AND NETWORK SECURITY

(2019 Admissions)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

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Section A

Answer any four questions.

Each question carries 2 weightage.

1. Briefly explain about DES.
2. Define security mechanism.
3. Specify the components of encryption algorithm.
4. Define the classes of message authentication function.
5. Write the network security applications.
6. What is the need to combine Security Associations ?
7. Mention about Password management.

(4 × 2 = 8 weightage)

Section B

Answer any four questions.

Each question carries 3 weightage.

8. Describe about evaluation criteria for AES.
9. Explain transposition techniques.

Turn over

10. Distinguish between direct and arbitrated digital signature ?
11. Specify the applications of the public key cryptosystem.
12. What is Kerberos ? Explain how it provides authentic services.
13. Why Internet Key Exchange is used ? Explain header and payload formats of it.
14. Summarize the three classes of intruders.

(4 × 3 = 12 weightage)

Section C

Answer any two questions.

Each question carries 5 weightage.

15. Compare all the features of stream and block ciphers.
16. Explain MACs based hash function with its design objectives and structure of the algorithm.
17. Explain in detail the operation of Secure Socket Layer in detail.
18. What is a firewall ? What is the need for firewalls ? What is the role of firewalls in protecting networks ?

(2 × 5 = 10 weightage)

**THIRD SEMESTER M.A./M.Sc./M.Com. DEGREE (REGULAR) EXAMINATION
NOVEMBER 2020**

(CBCSS)

Computer Science

CSS 3E 02 B—WIRELESS AND MOBILE NETWORKS

(2019 Admissions)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend all questions in each Section / Part.*
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Part A*Answer any four questions.**Each question carries 2 weightage.*

1. List out and explain the challenges faced by Wireless Communication.
2. Define Cellular network.
3. Differentiate between a GSM network and UMTS network.
4. Give the packet structure of IEEE 802.11.
5. Briefly explain about route optimization strategies.
6. Mention the components of WAP architecture.
7. Write a short note on datagram connection.

(4 × 2 = 8 weightage)

Part B*Answer any four questions.**Each question carries 3 weightage.*

8. Demonstrate the working principle of CDMA scheme.
9. Write the objectives of MAC protocols.
10. Mention the types of mobile transmission and explain.
11. What is HYPERLAN ? Explain.

Turn over

12. Describe Dynamic Host Configuration Protocol (DHCP).
13. Discuss the function mobile transport layer.
14. Explain persistent storage.

(4 × 3 = 12 weightage)

Part C

Answer any two questions.

Each question carries 5 weightage.

15. With appropriate figures, explain different TDMA mechanisms.
16. Differentiate Infrared transmission with Radio transmission.
17. What is meant by Mobil IP ? Discuss the goals and layers of mobile IP.
18. Describe Wireless session protocol.

(2 × 5 = 10 weightage)

**THIRD SEMESTER M.A./M.Sc./M.Com. DEGREE EXAMINATION
NOVEMBER 2020**

(CBCSS)

Computer Science

CSS 3E 01—(F) NUMERICAL AND STATISTICAL METHODS

(2019 Admissions)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend all questions in each Section / Part.*
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Section A

*Answer any four questions.
Each question carries 2 weightage.*

1. Find the truncation error in the first three terms of the function :

$$e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \frac{x^5}{5!} + \frac{x^6}{6!} \text{ for } x = 1/7.$$

2. Differentiate between linear and non-linear equations with suitable example.
3. Find joint probability of the events $A_1 = \{2, 4, 6\}$, $A_2 = \{4, 5, 6\}$ in the fair die probability space.
4. What is meant by homogenous equations ?
5. How could we improve the accuracy of a numerical integration process ?
6. Explain Random variables with suitable example.
7. Define slack and surplus variable with suitable example.

(4 × 2 = 8 weightage)

Section B

*Answer any four questions.
Each question carries 3 weightage.*

8. Differentiate between classical and axiomatic approach of probability.

Turn over

9. Solve using Gauss elimination with partial pivoting :

$$x_1 + x_2 - 2x_3 = 3$$

$$4x_1 - 2x_2 + x_3 = 5$$

$$3x_1 - x_2 + 3x_3 = 8.$$

10. Write an algorithm to find the root of an equation using Bisection method.

11. A college has to appoint a lecturer who must be B.Com., MBA, and Ph. D, the probability of which is $1/20$, $1/25$, and $1/40$ respectively. Find the probability of getting such a person to be appointed by the college.

12. Describe the effect of step size h on :

(a) Truncation error.

(b) Round off error.

(c) Total error.

13. Find the dual of the following primal

$$\text{Minimize } Z = 4x_1 + 2x_2 + x_3$$

subject to the constraints :

$$x_1 + x_2 \leq 10$$

$$3x_1 + x_2 + x_3 \geq 23$$

$$7x_1 - x_3 = 6$$

$$x_1, x_2, x_3 \geq 0.$$

14. Solve graphically the following linear programming problem :

$$\text{Minimize } Z = 3x_1 + 5x_2$$

subject to $-3x_1 + 4x_2 \geq 12$

$$2x_1 - x_2 \geq -2$$

$$2x_1 + 3x_2 \geq 12$$

$$x_1 \leq 4, x_2 \geq 2$$

$$x_1, x_2 \geq 0.$$

(4 × 3 = 12 marks)

Section C

Answer any **two** questions.
Each question carries 5 weightage.

15. Prove that the procedure $w_1 = (y+z)+x$ is better than the procedure $w_2 = (x+y)+z$ when $|x| > |y| > |z|$.
16. Describe the Trapezoidal method of computing integrals.
17. A company is faced with the problem of assigning six different jobs. The costs are estimated as follows (hundreds of rupees) :

<i>Jobs / Machine</i>	1	2	3	4	5
1	2.5	5	1	6	1
2	2	5	1.5	7	3
3	3	6.5	2	8	3
4	3.5	7	2	9	4.5
5	4	7	3	9	6
6	6	9	5	10	6

18. Derive the five-point central difference formula :

$$f'(x) = \frac{-f(x+2h) + 8f(x+h) - 8f(x-h) + f(x-2h)}{12h}$$

Also estimate the order of truncation error.

(2 × 5 = 10 weightage)

**THIRD SEMESTER M.A./M.Sc./M.Com. DEGREE EXAMINATION
NOVEMBER 2020**

(CBCSS)

Computer Science

CSS 3E 01 (E)—COMPUTER OPTIMIZATION TECHNIQUES

(2019 Admissions)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

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Part A

Answer any four questions.

Each question carries 2 weightage.

1. Define Linear Programming and mention its characteristics.
2. What are transportation problems ? Distinguish between feasible and basic feasible solution.
3. What is network analysis and mention its objectives ?
4. Explain revised simplex method.
5. Define parametric linear programming and goal programming.
6. Define cutting plane algorithm.
7. Define dynamic programming.

(4 × 2 = 8 weightage)

Turn over

Part B

Answer any four questions.

Each question carries 3 weightage.

8. Ozark Farms uses at least 800lb of special feed daily. The special feed is mixture of corn and soybean meal with the following compositions :

Feedstuff	Lb per lb of feedstuff		Cost(\$/lb)
	Protein	Fiber	
Corn	0.09	0.02	0.30
Soybean meal	0.60	0.06	0.90

The dietary requirements of the special feed stipulate at least 30% protein and at most 5% fibre. Ozark farms wishes to determine the daily minimum cost feed min.

9. Explain slack, surplus and unrestricted variables with examples.
10. Draw the network for the project whose activities with their relationships are given below :
A, C, D can start simultaneously ; E > B, C ; F, G > D ; H, I > E, F ; J > I, G ; K > H, B > A.
11. What is dual ? How will you write the dual of a given primal? Give the conditions employed in dual simplex method.
12. Explain Maximal Flow Algorithm.
13. Explain probabilistic EOQ Model.
14. Explain North West Corner Method in transportation problem.

(4 × 3 = 12 weightage)

Part C

Answer any two questions.

Each question carries 5 weightage.

15. Solve the LPP by simplex method :

$$\text{Maximize } Z = 7x_1 + 5x_2$$

$$\text{Subject to } x_1 + 2x_2 \leq 6$$

$$4x_1 + 3x_2 \leq 12$$

$$x_1, x_2 \geq 0.$$

16. Explain Vogel Approximation method. Solve the following TP by Vogel Approximation method :

Mil/Silo	M_1	M_2	M_3	M_4	Supply
S_1	10	2	20	11	15
S_2	12	7	9	20	25
S_3	4	14	16	18	10
Demand	5	15	15	15	

17. A project schedule has the following characteristics :

Activity	Time
1-2	4
1-3	1
2-4	1
3-4	1
3-5	6
4-9	5
5-6	4
5-6	8
6-8	1
7-8	2
8-10	5
9-10	7

Construct network diagram and find the critical path and project duration.

18. Define integer linear programming. Explain briefly the integer programming algorithms.

(2 × 5 = 10 weightage)

**THIRD SEMESTER M.A./M.Sc./M.Com. DEGREE (REGULAR) EXAMINATION
NOVEMBER 2020**

(CBCSS)

Computer Science

CSS 3E 01 D—BIOINFORMATICS

(2019 Admissions)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

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Section A*Answer any four questions.**Each question carries 2 weightage.*

1. Write a note on Bioinformatics.
2. Mention about Proteins.
3. Define the concept of Dynamic programming.
4. Briefly explain about BLAST and FASTA.
5. Write about amino acid sequence alignment.
6. Explain N dimensional dynamic programming.
7. Discuss ExPASy.

(4 × 2 = 8 weightage)

Section B*Answer any four questions.**Each question carries 3 weightage.*

8. Discuss DNA double helix.
9. Explain about graph algorithms.

Turn over

10. Write about Dot - plot visualization.
11. Describe the tools for MSA.
12. What is genome database ? Give example.
13. Define the Phylogenetic algorithms.
14. Describe about nucleic acid sequence databases.

(4 × 3 = 12 weightage)

Section C

Answer any two questions.

Each question carries 5 weightage.

15. Discuss about exhaustive search methods.
16. Describe Clustering algorithms.
17. Explain the evaluation of Phylogenetic trees.
18. Elaborate Protein sequence data base.

(2 × 5 = 10 weightage)

**THIRD SEMESTER M.A./M.Sc./M.Com. DEGREE (REGULAR) EXAMINATION
NOVEMBER 2020**

(CBCSS)

Computer Science

CSS 3E 01 C—WEB TECHNOLOGY

(2019 Admissions)

Time : Three Hours

Maximum : 30 Weightage

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Section A*Answer any four questions.**Each question carries 2 weightage.*

1. Write the format of SGML applications.
2. Write the format of DTD for attributes in HTML.
3. What are the rules to name a valid identifier in Java script. Give examples.
4. Write the difference between Java and Java Script.
5. What is proxy server ? What are its basic functions ?
6. Write the difference between for loop and for each in PHP.
7. Write the features of Apache.

(4 × 2 = 8 weightage)

Section B*Answer any four questions.**Each question carries 3 weightage.*

8. Write a JavaScript code to implement event handlers.
9. Write the HTML code to implement anchor tag with its attributes.
10. Explain web servers. Which are the tools used for it ?

Turn over

11. Differentiate HTML and XML in their coding. How they differ in their usage ?
12. What is CGI ? How it support Apache server to create dynamic web ?
13. Explain the steps to configure Apache in Windows.
14. Explain the strength and weakness of JavaScript.

(4 × 3 = 12 weightage)

Section C

Answer any two questions.

Each question carries 5 weightage.

15. Explain various control flow statements in PHP with example programme.
16. What is the importance of Virtual Host ? Explain how it can be included with Apache server.
17.
 - a) Explain the important qualities of CMS.
 - b) Explain the features of PHP for creating dynamic web pages.
18. Explain various form controls and their attributes in HTML.

(2 × 5 = 10 weightage)

**THIRD SEMESTER M.A./M.Sc./M.Com. DEGREE (REGULAR)
EXAMINATION, NOVEMBER 2020**

(CBCSS)

Computer Science

CSS 3E 01 A—COMPUTER GRAPHICS

(2019 Admissions)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

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Section A

Answer any four questions.

Each question carries 2 weightage.

1. Compare random scan and raster scan.
2. Define a Spline.
3. What are the applications of computer graphics ?
4. What are the properties of a bezier curve ?
5. Identify the significance of glut function in OpenGL.
6. What is refresh CRT ?
7. Write the significance of texture mapping in computer graphics.

(4 × 2 = 8 weightage)

Section B

Answer any four questions.

Each question carries 3 weightage.

8. What is the significance of homogenous co-ordinates in transformations ?
9. Compare parallel and perspective projections.

Turn over

10. Explain window to view port transformation.
11. How can you represent a curve ?
12. Given $P(2, 5)$, $S_x = 3$, $S_y = 5$ and fixed point $(1, 4)$. Use that matrix to find P' .
13. Illustrate the given statement "Successive Scaling Operations are multiplicative".
14. What is visible surface detection ?

(4 × 3 = 12 weightage)

Section C

Answer any two questions.

Each question carries 5 weightage.

15. How does a cathode ray tube work ?
16. Write an OpenGL program to draw a circle.
17. Illustrate the algorithm for Cohen Sutherland line clipping.
18. Explain 3D rotation and write the matrix for different axes.

(2 × 5 = 10 weightage)

**THIRD SEMESTER M.A./M.Sc./M.Com. DEGREE (REGULAR)
EXAMINATION, NOVEMBER 2020**

(CBCSS)

Computer Science

CSS 3C 13—PRINCIPLES OF COMPILERS

(2019 Admissions)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

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Section A

Answer any four questions.

Each question carries 2 weightage.

1. Briefly explain about Interpreter.
2. What are the commonly used buffering methods ?
3. Define Parser.
4. What is the significance of intermediate code ?
5. Define Symbol table.
6. Mention the techniques in loop optimization.
7. What is Cross - Compiler ?

(4 × 2 = 8 weightage)

Section B

Answer any four questions.

Each question carries 3 weightage.

8. What are the issues in lexical analysis ?
9. How can you convert the 'Case Statements' into intermediate code ? Give example.

Turn over

10. Explain the sequence of stack allocation processes for a function call.
11. Illustrate optimization basic blocks with examples.
12. Write detailed notes on parameter parsing.
13. Describe about region based analysis.
14. Write a note on shift reduce parsing.

(4 × 3 = 12 weightage)

Section C

Answer any two questions.

Each question carries 5 weightage.

15. Explain with an example conversion of NFA to DFA.
16. Write in detail about Predictive parsing and Bottom up parsing.
17. Explain about flow graphs with suitable example.
18. Give a detailed note on Storage allocation strategies.

(2 × 5 = 10 weightage)

**THIRD SEMESTER M.A./M.Sc./M.Com. DEGREE (REGULAR) EXAMINATION
NOVEMBER 2020**

(CBCSS)

Computer Science

CSS 3C 12—OBJECT ORIENTED PROGRAMMING CONCEPTS

(2019 Admissions)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

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Section A*Answer any four questions.**Each question carries 2 weightage.*

1. What is message passing in object oriented programming ?
2. What is the use of new operator in Java ?
3. How IP address is managed in Java programming ?
4. What is the difference between byte stream and character stream ?
5. Which classes can an applet extend ?
6. What is the purpose of database drivers ?
7. What is need for unified modelling language ?

(4 × 2 = 8 weightage)

Section B*Answer any four questions.**Each question carries 3 weightage.*

8. Why Java is called as a platform independent ?
9. Write the different methods in Java to declare objects and write the peculiarities of each.
10. How an applet can be embedded in HTML page ?

Turn over

11. Write the differences between Japplet and applets.
12. Write the differences between ServerSocket and Socket in reference to their constructors.
13. Explain the purpose of 'finally' keyword in Java.
14. Write the life cycle of thread in Java.

(4 × 3 = 12 weightage)

Section C

*Answer any two questions.
Each question carries 5 weightage.*

15. Explain the primitive data types in java and compare it with the data types of any other programming language.
16. What do you mean by constructor in Object Oriented Programming? Write the different constructors and its usage in Java.
17. Write importance of exception handling mechanism in Java, include sufficient examples in your explanation.
18. Identify the necessary classes for a Library automation system and draw a UML class diagram for it.

(2 × 5 = 10 weightage)

**THIRD SEMESTER M.A./M.Sc./M.Com. DEGREE (REGULAR)
EXAMINATION, NOVEMBER 2020**

(CBCSS)

Computer Science

CSS 3C 11—ADVANCED DATABASE MANAGEMENT SYSTEMS

(2019 Admissions)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

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Section A

Answer any four questions.

Each question carries 2 weightage.

1. Differentiate DDL and DML.
2. What is a weak entity set ?
3. What do you mean by locks in DBMS ?
4. Define a transaction in DBMS.
5. What is the importance of timestamp ordering protocol ?
6. Identify the use of drop statement in table ?
7. Write the syntax SQL command for editing the field 'name' in the table 'student' ?

(4 × 2 = 8 weightage)

Section B

Answer any four questions.

Each question carries 3 weightage

8. Write the significance of primary key, candidate key and foreign key with example.
9. Give an example for Functional dependency.

Turn over

10. What is the use of 'having' clause in SQL ? Mention a proper example.
11. Write a short note on recovery management in DBMS.
12. List the advantages of Object Oriented Database Management Systems.
13. What is commit Protocol in distributed database ?
14. What is the difference between relational algebra and calculus ?

(4 × 3 = 12 weightage)

Section C

Answer any two questions.

Each question carries 5 weightage

15. Consider the tables Employee, salary and personal. Draw the ER diagram for these tables with proper relationships.
16. What do you mean by stored procedures ? Write the significance of stored procedure with an example.
17. Consider two tables student and marks for storing the personal details and mark details of a student. Create these two tables by identifying the necessary fields. Write the SQL for displaying the name and address of the students those who have secured highest marks in every subjects.
18. What is the importance of distributed database in modern computing paradigm ? Compare the working of distributed database with DBMS and OODBMS.

(2 × 5 = 10 weightage)

**THIRD SEMESTER M.Sc. DEGREE (SUPPLEMENTARY) EXAMINATION
NOVEMBER 2020****(CUCSS)****Computer Science****CSS 3E 05 E—FUNDAMENTALS OF BIG DATA****(2014 Admissions)****Time : Three Hours****Maximum : 36 Weightage****Part A***Answer all questions.**Each question carries 1 weightage.*

1. What is the database used for forming complex query in unstructured datatypes ?
2. What is node relationship ?
3. Expand ACID.
4. Differentiate facts and events.
5. Define predictive modelling in advanced analytics.
6. What is Open Chorus ?
7. Which modifier limits the number of array elements during a push operation in MongoDB ?
8. What does *elemMatch* operator do in MongoDB ?
9. What is Flume ?
10. Differentiate Pig and Pig Latin.
11. What is Hive ?
12. How are Writable data types used in Hadoop ?

(12 × 1 = 12 weightage)

Part B

Answer any six questions.

Each question carries 2 weightage.

13. Briefly explain *Riak key value* database.
14. Draw the architecture of big data and explain.
15. Name some examples of application building blocks available to incorporate into semi-custom applications for big data analysis.
16. Briefly explain the analysis performed by NLP at different levels of big data stack.
17. Explain the different data models available in MongoDB.
18. Give an example of push and *pushall* operators in MongoDB.
19. Briefly explain the different HDFS components.
20. What are the features of Hive ? Explain.
21. Write a simple MapReduce program in any language.

(6 × 2 = 12 weightage)

Part C

Answer any three questions.

Each question carries 4 weightage.

22. Write a note on document databases.
23. Briefly explain the additional characteristics of big data analysis that make it different from traditional kinds of data analysis.
24. State some advantages of NoSQL databases over relational databases.
25. Explain with an example how load, transform and dump commands are used in Pig Latin.
26. What are the various steps involved in redefining the table with correct column separator in hive ?
27. What are the sources of data in structure data? Explain with examples.

(3 × 4 = 12 weightage)

**THIRD SEMESTER M.Sc. DEGREE (SUPPLEMENTARY) EXAMINATION
NOVEMBER 2020**

(CUCSS)

Computer Science

CSS 3E 05 C—SYSTEM SECURITY

(2014 Admissions)

Time : Three Hours

Maximum : 36 Weightage

Part A

Answer all questions.

Each question carries 1 weightage.

1. What are the three main goals of security ?
2. Differentiate between interception and interruption.
3. Why Salami Attacks Persist ?
4. How would you prevent virus infection ?
5. What are the limitations of security systems ?
6. Define fence and relocation.
7. How do you find SQL injection vulnerabilities ?
8. Define the term Commit flag in database.
9. List all the groups of personnel's who should have representatives in a security planning team.
10. Define Two-Phase update.
11. What do you think about Insecure Direct Object Reference ?
12. Name any four physical security devices.

(12 × 1 = 12 weightage)

Part B

Answer any six questions.

Each question carries 2 weightage.

13. What are the several aspects that can enhance the effectiveness of controls ?
14. Discuss the security perspective of a systems hack.
15. Demonstrate the various good coding practices.
16. List out the truths and misconceptions about viruses.
17. What are the different methods of protection ?
18. Write a note on Requirements of security systems.
19. Differentiate between state and transition constraints.
20. What are the corrective actions taken for maintain the integrity of database ?
21. List three factors that should be considered when developing a security plan.

(6 × 2 = 12 weightage)

Part C

Answer any three questions.

Each question carries 4 weightage.

22. Explain different types of security.
23. Briefly explain the concepts of user authentication.
24. What are the different assurance methods that can be used in operating system ?
25. What is meant by database security ? List and discuss the different issues related to database Security.
26. Write and explain steps of risk analysis.
27. Explain the Concurrency control mechanisms with an example.

(3 × 4 = 12 weightage)

**THIRD SEMESTER M.Sc. DEGREE (SUPPLEMENTARY) EXAMINATION
NOVEMBER 2020**

(CUCSS)

Computer Science

CSS 3E 05 A—DATA COMPRESSION

(2014 Admissions)

Time : Three Hours

Maximum : 36 Weightage

Part A

Answer all questions.

Each question carries 1 weightage.

1. Define cardinality.
2. Define entity sets.
3. What is data independence ?
4. Give examples of GIF images, test images and JPEG.
5. Why is vector quantization rarely used in practical applications ?
6. What is image compression ?
7. What is sampling ?
8. Define quantization.
9. What is image transform ?
10. Name any two video compression standards.
11. What is the role of DBA ?
12. What is DWT ?

(12 × 1 = 12 weightage)

Part B

Answer any six questions.

Each question carries 2 weightage.

13. Enlist and explain the various relationships of database.
14. Differentiate between weak and strong entity.
15. What are the characteristics of relations ?

Turn over

16. How does the decoder know whether the encoder selects the first match or the last match ?
17. What are two main types of Data compression ?
18. What is a composite source model ?
19. Explain wavelet transform method.
20. Differentiate between frequency masking and temporal masking.
21. Differentiate between digital audio and sound.

(6 × 2 = 12 weightage)

Part C

*Answer any three questions.
Each question carries 4 weightage.*

22. Explain mapping in DBMS architecture. What is the need of mappings between schema levels ?
23. What are the responsibilities of DBA and the database designers ? Explain.
24. What is lossless compression and lossy compression ? Briefly explain with example.
25. Explain Haar transform and draw four Haar wavelets.
26. Write short note on compression algorithms.
27. Explain image compression by fractal based technique.

(3 × 4 = 12 weightage)

**THIRD SEMESTER M.Sc. DEGREE (SUPPLEMENTARY)
EXAMINATION, NOVEMBER 2020**

(CUCSS)

Computer Science

CSS 3E 04 F—DATA WAREHOUSING AND MINING

(2014 Admissions)

Time : Three Hours

Maximum : 36 Weightage

Part A

*Answer all questions.
Each question carries 1 weightage.*

1. What are the applications of data mining ?
2. What is data warehouse ?
3. What do you mean by multidimensional data model ?
4. Define the term Gini Index.
5. What do you mean by data reduction ?
6. What do you mean by specificity ?
7. What is Decision Tree ?
8. What is PAM ?
9. Explain outlier analysis.
10. What is Graph mining ?
11. Give a short note on spatial mining.
12. Define support and confidence.

(12 × 1 = 12 weightage)

Part B

*Answer any six questions.
Each question carries 2 weightage.*

13. Differentiate between database and data warehouse.
14. Explain any two types of attributes with examples.

Turn over

15. Explain any one data reduction technique with example.
16. What is a confusion matrix ? Explain the use of confusion matrix with an example.
17. Explain the use of ensemble methods in classification.
18. What are the different types of data in cluster analysis ? Explain.
19. Write a short note on density-based clustering method.
20. Write a note on descriptive mining.
21. Differentiate between classification and clustering.

(6 × 2 = 12 weightage)

Part C

*Answer any three questions.
Each question carries 4 weightage.*

22. What is OLAP? Explain how does it help in data mining with illustration.
23. Explain any two methods for data cleaning.
24. Explain Naive Bayes classifier with example.
25. Explain DBSCAN clustering algorithm.
26. Explain the role of data mining in World Wide Web.
27. Explain the different steps in data mining for knowledge recovery.

(3 × 4 = 12 weightage)

**THIRD SEMESTER M.Sc. DEGREE (SUPPLEMENTARY) EXAMINATION
NOVEMBER 2020****(CUCSS)****Computer Science****CSS 3C 03—OBJECT ORIENTED PROGRAMMING CONCEPTS****(2014 Admissions)****Time : Three Hours****Maximum : 36 Weightage****Part A***Answer all questions.**Each question carries 1 weightage.*

1. What is Encapsulation ?
2. What is Bytecode ?
3. What is an Object ?
4. What is the use of *this* ?
5. What are Constructors ?
6. What are Exceptions ?
7. What are stream classes ?
8. What is a thread class ?
9. What is AWT ?
10. How do applets differ application programs ?
11. What is InetAddress ?
12. What is UML ?

(12 × 1 = 12 weightage)**Turn over**

Part B

Answer any six questions.

Each question carries 2 weightage.

13. Distinguish between *break* and *continue* statements in Java.
14. Explain the *if* construct in Java.
15. What do you mean by method overloading ? Explain with an example.
16. Define package ? How do you design a package in Java ?
17. Explain the purpose of *finally* clause of *try-catch-finally* statement in Java.
18. Explain how do you create and execute an Applet.
19. Differentiate between AWT and Swing.
20. Write a short note on UML class diagrams.
21. Give an account on various JDBC drivers.

(6 × 2 = 12 weightage)

Part C

Answer any three questions.

Each question carries 4 weightage.

22. What are the different control structures in Java ? Explain any *four* of them with examples.
23. Describe the various forms of implementing interface in Java. Give examples of java code for each one.
24. Explain the hierarchy of input stream classes in Java.
25. Explain any four important Swing classes and its applications in detail.
26. What are the different types of statements in JDBC ? Explain each one.
27. Write an applet program that receives three numeric values as input from the user and then display the largest of three on the screen.

(3 × 4 = 12 weightage)

**THIRD SEMESTER M.Sc. DEGREE (SUPPLEMENTARY)
EXAMINATION, NOVEMBER 2020**

(CUCSS)

Computer Science

CSS 3C 02—PRINCIPLES OF COMPILERS

(2014 Admissions)

Time : Three Hours

Maximum : 36 Weightage

Part A

Answer all questions.

Each question carries 1 weightage.

1. Define a Translator.
2. Compare Compiler with Interpreter.
3. When is an error detected in predictive parsing ?
4. Define a FIRST function in Top down parsing.
5. Write the syntax grammar for Backpatching.
6. How is Break statement used in Code generation ?
7. What is Check type expression in compilers ?
8. What is control stack in run time environment ?
9. Define an activation tree.
10. What is peephole optimization in code generation ?
11. List three instances of data flow.
12. Define Code Motion in code optimization.

(12 × 1 = 12 weightage)

Part B

Answer any six questions.

Each question carries 2 weightage.

13. Explain a hybrid compiler.
14. Mention some examples of compiler tokens used in lexical analysis.

Turn over

15. Compare top down and bottom up parsing in syntax analysis.
16. Describe Shift reduced parsing.
17. Describe Triples in compiler intermediate code generation.
18. Explain Type declaration in compilers.
19. How is Manual deallocation made during run time environment ?
20. List out the major issues with nested procedures.
21. Mention importance of data flow abstraction.

(6 × 2 = 12 weightage)

Part C

*Answer any **three** questions.
Each question carries 4 weightage.*

22. Describe some commonly used compiler-construction tools.
23. Illustrate Steps for constructing the DAG.
24. Compare Static and dynamic memory allocation in Run time environments.
25. Describe an Activation tree call during an execution of quicksort.
26. Explain the major issues during design of a code generator.
27. Describe Live variable analysis.

(3 × 4 = 12 weightage)

**THIRD SEMESTER M.Sc. DEGREE (SUPPLEMENTARY) EXAMINATION
NOVEMBER 2020****(CUCSS)****Computer Science****CSS 3C 01—ADVANCED DATABASE MANAGEMENT SYSTEMS****(2014 Admissions)****Time : Three Hours****Maximum : 36 Weightage****Part A***Answer all questions.**Each question carries 1 weightage.*

1. What do you mean by data abstraction ?
2. What is E-R model ?
3. Define Primary Key.
4. If a relation R and S has m and n tuples respectively, then how many tuples are therein a relation Z which is a join operation of R and S ?
5. What is functional dependency ?
6. Give any two DDL commands in SQL.
7. How will you delete a table in RDBMS ?
8. What are Cursors ?
9. What is deadlock ?
10. What do you mean by isolation ?
11. List any two advantages of OODBMS.
12. What is the role of commit protocol in distributed databases ?

(12 × 1 = 12 weightage)**Part B***Answer any six questions.**Each question carries 2 weightage.*

13. What is weak entity ? Give an example.
14. Write a short note on Relational Calculus.

Turn over

15. What is BCNF ?
16. Explain about project join normal form.
17. What is a view ? Explain how will you remove a column from a view.
18. Explain the purpose and syntax of DROP statement in SQL with example.
19. What are the different phases of a transaction ? Explain.
20. Explain two-phase locking mechanism.
21. Differentiate between OODBMS and RDBMS.

(6 × 2 = 12 weight)

Part C

Answer any three questions.

Each question carries 4 weightage.

22. What are the different data models ? Explain each one.
23. What do you mean by database normalization ? Explain 1NF, 2NF and 3NF with examples.
24. Consider the following tables :
Employee (Emp_no, Name, Emp_city)
Company (Company_name, Emp_no, Salary)
 - i) Write a SQL query to display employee name and company name in which the employee is working.
 - ii) Write a SQL query to display employee name, employee city, company name and salary of all the employees whose salary is greater than 10000.
 - iii) Write a query to display all the employees working in 'ABC' company.
 - iv) Write a SQL query to display the name of the employee who draws highest salary in each company.
25. Discuss why concurrency control and recovery is needed in the transaction processing of Database Management Systems ?
26. Explain the use of HAVING and GROUP BY clause in SQL with example.
27. Explain the salient features of distributed database system.

(3 × 4 = 12 weightage)

THIRD SEMESTER P.G. DEGREE EXAMINATION, NOVEMBER 2020

(CCSS)

M.Sc. Computer Science

CSC 3E 16—DATA ANALYTICS WITH PYTHON

(2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

Answer any five full questions.

1. (A) Name the different data analytics tools available. Briefly explain any *four*.
(B) Differentiate supervised and unsupervised machine learning with example.
2. (A) What are the different data types present in python ? Explain.
(B) How do you define the computational capability of python ? Explain the various tools available for the same.
3. (A) Explain the suitability of machine learning algorithms in data science problems with an example.
(B) What is dimensionality reduction ? Why is it needed in machine learning ?
4. (A) What is Regularization? Explain the importance of the same in machine learning.
(B) What are the different validation techniques used for clustering ? Explain.
5. (A) How is dimensionality reduction performed in machine learning ? Explain with an example.
(B) Differentiate classification and clustering with at least four differences.
6. (A) What are the skills required for a data scientist ? Explain.
(B) What is regression ? Briefly explain the usage of this technique.
7. (A) Describe the following packages in python :
 - (i) Numpy.
 - (ii) Pandas.
 - (iii) Scikit-learn.
 - (iv) Matplotlib.
8. (A) Explain the usage of classes and packages in python.
(B) Briefly explain the following :
 - (i) Feature selection.
 - (ii) Generalization.

(5 × 16 = 80 marks)

THIRD SEMESTER P.G. DEGREE EXAMINATION, NOVEMBER 2020

(CCSS)

M.Sc. Computer Science

CSC 3E 08—DIGITAL IMAGE PROCESSING

(2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

Answer any five full questions.

1. A) What is a digital image ? Explain how it is represented. Also explain the basic relationship between pixels in a digital image. (10 marks)
- B) Distinguish between sampling and quantization. (6 marks)
2. A) Explain about Discrete Cosine transforms. (8 marks)
- B) Give an account on Hotelling transforms. (8 marks)
3. A) Obtain histogram equalization of the following 8-bit image segment of size 5×5 .

Also write inference on image segment before and after histogram equalization :

200	200	200	180	240
180	180	180	180	190
190	190	190	190	180
190	200	220	220	240
230	180	190	210	230

- B) Explain the different image arithmetic operations with illustration. (8 + 8 = 16 marks)
4. A) Explain the use of least mean square filtering in image restoration. (8 marks)
- B) Discuss any *two* region based image segmentation methods in detail. (8 marks)
5. A) Encode the sentence *I LIKE IMAGE PROCESSING* using arithmetic coding procedure.
- B) Give an account on image compression standards. (8 + 8 = 16 marks)

Turn over

6. A) Explain the fundamental steps in digital image processing. (8 marks)
- B) What is Fourier transform ? Explain the different properties of Fourier transform. (8 marks)
7. A) Explain the image degradation/restoration process model with suitable diagram. (8 mark.
- B) Give an account on boundary descriptors. (8 marks)
8. A) Explain bit-plane coding with an example. (8 mark
- B) Mention the different techniques for the representation of shapes in digital image. (8 marks)

THIRD SEMESTER P.G. DEGREE EXAMINATION, NOVEMBER 2020

(CCSS)

M.Sc. Computer Science

CSC 3C 14—WEB TECHNOLOGY

(2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

Answer any five full questions.

1. A) Explain XML document structure. (5 marks)
B) Explain about HTML DTD with an example. (6 marks)
C) Give the syntactic differences between HTML and XHTML. (5 marks)
2. A) What is CGI script ? Explain the differences between server-side scripting and client- side scripting. (8 marks)
B) Write a subroutine to find whether the string given by the user is a palindrome or not using a Perl script. (8 marks)
3. A) List and explain any three JSP scripting elements with examples. (9 marks)
B) Explain the life cycle of a JSP page. (7 marks)
4. A) Explain the different control flow structures in PHP with examples. (8 marks)
B) Discuss the different steps for connecting and maintaining MySQL database as a back end of PHP. (8 marks)
5. A) Write a python program to describe different ways of deleting an element from the given List. (8 marks)
B) Explain how GET and POST methods are handled in Python with example. (8 marks)
(8 + 8 = 16 marks)
6. A) Explain the form processing procedure in CGI script. Also specify how to access HTML form data from CGI script. (8 marks)
B) Explain the different string handling functions in PHP with examples. (8 marks)
(8 + 8 = 16 marks)

7. A) Write a Python program to store N numbers in a list and sort the list in ascending order.
B) List any four criteria for writing a well-formed XML document with an example.

(8 + 8 = 16 marks)

8. A) Explain how to create a module and use it in python program with example.
B) Explain the advantages of JSP over various server-side programming techniques.

(8 + 8 = 16 marks)

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THIRD SEMESTER P.G. DEGREE EXAMINATION, NOVEMBER 2020

(CCSS)

M.Sc. Computer Science

CSC 3C 13—DATA COMMUNICATION AND NETWORKING

(2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

*Answer any five full questions.**Each question carries equal marks.*

1. (A) Explain any *two* guided transmission media in detail.
(B) Explain about time division multiplexing and frequency division multiplexing.
2. (A) Explain the procedure for pure ALOHA protocol with a flow chart.
(B) Differentiate between synchronous and asynchronous data transmission.
3. (A) Explain the Bluetooth Architecture.
(B) Compare and contrast IPv4 and IPv6 addressing schemes.
4. (A) Explain TCP congestion control mechanism in detail.
(B) Give an account on the different functions of Application layer.
5. (A) Explain the principles and goals of network security.
(B) Explain about private and public key encryption systems.
6. (A) Explain the differences between parallel and serial data transmission.
(B) What is the firewall ? Explain the architecture and use of firewalls.
7. (A) What is CRC ? If the generating polynomial for CRC code is $x^4 + x^3 + 1$ the message word is 11110000. Determine the check bits and the encoded word.
(B) Explain the frame format of HDLC protocol.
8. (A) Write a note on IEEE802.6 standards.
(B) Write a short note on :
 - (i) Telnet.
 - (ii) HTTP.

THIRD SEMESTER P.G. DEGREE EXAMINATION, NOVEMBER 2020

(CCSS)

Computer Science

CSC3C12—PRINCIPLES OF COMPILER DESIGN

(2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

Answer any five full questions.

1. A) Define a compiler and explain its different phases in detail.
B) Explain with examples role of lexical analyser during compilation.
2. A) Describe the concept of operator precedence in parsing and state its importance.
B) Illustrate with examples the usage of recursive descent parsing.
3. A) Describe some commonly used three-address instruction forms in code generation.
B) With examples illustrate the procedure calls used in compiler code generation.
4. A) Explain the major issues that a compiler should manage during run time.
B) Illustrate DAG representation of blocks during code generation.
5. A) Explain region-based symbolic analysis in code optimisation.
B) Describe various source language issues addressed by compilers.
6. A) Illustrate with a diagram position and role of a parser in compiler model.
B) Explain Error recovery strategies in syntax analysis.
7. A) With a Fibonacci series program explain stack allocation of space.
B) Explain the basic flow graphs and blocks used for code generation in compilers.
8. A) Explain parameter passing procedure in run time environment.
B) With an example explain a simple target machine model.