THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

(CBCSS)

Computer Science

CSS 3E 02 G—MACHINE LEARNING

(2020 Admission onwards)

Time : Three Hours   Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend* **all** *questions in each section.*

2. *The minimum number of questions to be attended from the Section/Part shall remain the same.*

3. *The instruction if any, to attend a minimum number of questions from each sub section/sub part/ sub division may be ignored.*

4. *There will be an overall ceiling for each Section/Part that is equivalent to the maximum weightage of the Section/Part.*

Section A (Short Answers)

Answer any **four** *questions.*

Each question carries 2 weightage.

1. Compare classification and regression.

2. Identify an application where machine learning can be employed. Justify your response.

3. Explain cross validation.

4. Outline the working principle of K means clustering.

5. How does principal component analysis helps in dimensionality reduction ?

6. Define accuracy, precision and recall in classification.

7. Explain the working of an artificial neuron.

(4 × 2 = 8 weightage)

Section B (Short Essays)

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

8. Outline the significance of "hypotheses" in "concept learning".

9. Explain linear regression with an example.

10. Explain the principle and working of Bayesian classifier.

11. Explain hierarchical clustering with suitable illustrations.

12. Discuss backpropagation algorithm.

13. Explain overfitting and underfitting in classification. Outline measures to address overfitting / underfitting.

14. Discuss the basic elements of reinforcement learning.

(4 × 3 = 12 weightage)

Section C (Essays)

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

15. Differentiate between regression tree and classification tree. Explain Gini index and its role in decision tree construction. Discuss the steps in constructing a regression tree.

16. Discuss Expectation Maximization Algorithm.

17. Give a detailed account of cross-validation and resampling methods.

18. Explain the architecture and working of multilayer perceptrons. Explain any two activation functions.

(2 × 5 = 10 weightage)

THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

[November 2020 for SDE/Private Students]

(CBCSS)

Computer Science

CSS 3E 02 F—DATA WAREHOUSING AND MINING

(2019 Admission onwards)

Time : Three Hours   Maximum : 30 Weightage

General Instructions (Not applicable to SDE/Private Students)

1. *In cases where choices are provided, students can attend* **all** *questions in each section.*

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Section A

Answer any **four** *questions.*

Each question carries 2 weightage.

1. List the data mining functionalities.

2. What is multi-relational OLAP ?

3. What is a decision tree ?

4. What is meta data ?

5. What you mean by lazy learner ?

6. What is rule based classification ?

7. What do you mean by the accuracy of a classifier ?

(4 × 2 = 8 weightage)

Section B

Answer any **four** *questions.*

Each question carries 3 weightage.

8. Write short note on support and confidence measures.

9. Explain how the outliers can be detected in clustering.

10. Demonstrate the application of data mining for financial analysis.

11. Explain the concept of knowledge base.

12. Write a short note on multimedia data mining.

13. Differentiate data transformation and data integration.

14. Write the important steps in text mining.

(4 × 3 = 12 weightage)

Section C

Answer any **two** *questions.*

Each question carries 5 weightage.

15. Differentiate between Operational Database System and Data Warehouse.

16. Explain the steps of the Apriori algorithm for mining frequent item sets with candidate generation.

17. What is a spatial database ? Explain the methods of mining spatial databases ?

18. Explain how the classification model can be evaluated. Include the explanation for all the measures used in the evaluation process.

(2 × 5 = 10 weightage)

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THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

(CBCSS)

Computer Science

CSS 3E 02 E—VIRTUALIZATION AND CLOUD COMPUTING

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend* **all** *questions in each section.*

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Section A

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

1. Define virtualization.

2. List the phases in data security life cycle.

3. What are the types of cloud software environments ?

4. What is storage networking ?

5. What is Hadoop ?

6. What do you mean by security governance ?

7. What is the use eucalyptus software in cloud ?

(4 × 2 = 8 weightage)

Section B

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

8. Write a short note on cloud infrastructure components.

9. State any three essential characteristics of cloud computing.

Turn over

10. Write a short note on desktop virtualization.

11. Discuss HDFS Architecture.

12. What are the security challenges of cloud computing.

13. Write a short note on Security monitoring in cloud.

14. What you mean by global exchange of cloud resources ?

(4 × 3 = 12 weightage)

Section C

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

15. Explain the cloud delivery models.

16. Discuss in detail the various aspects for the need of virtualization in cloud computing.

17. Illustrate Map Reduce and the advantages.

18. Explain the layered cloud architecture with a neat diagram.

(2 × 5 = 10 weightage)

THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

(CBCSS)

Computer Science

CSS 3E 02 D—ADVANCED WEB TECHNOLOGY

(2019 Admission onwards)

Time : Three Hours   Maximum : 30 Weightage

General Instructions

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Section A

Answer any four questions.
Each question carries 2 weightage.

1. Mention the Key features of Web 2.0.

2. Give a note on Moo Tools.

3. Mention the benefits of Web services.

4. Define Stack.

5. Give a note on CGI.

6. Give a note on SQL commands.

7. Explain about INSERT.

(4 × 2 = 8 weightage)

Turn over

Section B

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

8. Write about server side technologies Python and J2EE.

9. Explain the components of XML RPC and WSDL.

10. Discuss UDDI.

11. Explain about strings.

12. Write a note on server side scripting.

13. How to fetch a result in SQL ? Explain.

14. Deletion of Data using Python. Give example.

(4 × 3 = 12 weightage)

Section C

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

15. Explain the concept Social Web.

16. Elaborate the encrypted communication via SSL with example.

17. Describe in detail about functions in python with examples.

18. Discuss table creation and selection process in SQL with examples.

(2 × 5 = 10 weightage)

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THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

(CBCSS)

Computer Science

CSS 3E 02 C—CRYPTOGRAPHY AND NETWORK SECURITY

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

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Part A

Answer any **four** *questions.*

Each question carries 2 weightage.

1. What is encryption and decryption ?

2. Write the five modes of operation of Block cipher.

3. Differentiate MAC and hash function.

4. What is Kerberos ? What are the uses ?

5. Briefly explain about handshake protocol.

6. Define virus. Specify the types of viruses ?

7. List and explain the design goals of firewalls.

(4 × 2 = 8 weightage)

Part B

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

8. Differentiate symmetric and asymmetric encryption ?

9. What is meant by security service ? Explain various security services.

10. Give detailed notes on Message Authentication Codes.

11. Explain Client/Server Authentication Exchange service in Kerberos version 4.

12. Specify the use of SSL protocol? Explain SSL record protocol.

13. What is a worm ? Name some known worms and explain.

14. Give detailed notes on Intrusion detection.

(4 × 3 = 12 weightage]

Part C

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

15. Compare the substitution method in DES and AES. Why do we need only one substitution table in AES, but several in DES ? Explain.

16. Describe the steps in message digest generation in Secure Hash Algorithm.

17. Explain transport layer security.

18. Discuss about VPN.

(2 × 5 = 10 weightage)

THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

(CBCSS)

Computer Science

CSS 3E 02 B—WIRELESS AND MOBILE NETWORKS

(2019 Admission onwards)

Time : Three Hours   Maximum : 30 Weightage

General Instructions

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Part A

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

1. Mention the different types of signal propagation.

2. State some of the features of CDMA.

3. Write the MAC mechanism used in WLAN.

4. Evaluate in what ways is GPRS better than GSM.

5. How does TCP detect and handle congestion ?

6. Mention the role of session protocol.

7. Briefly explain event handling.

(4 × 2 = 8 weightage)

Part B

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

8. What are the limitations of mobile computing ?

9. What is FDMA ? Explain.

Turn over

10. Describe the functions of IEEE 802.11.

11. Write the functions of Bluetooth.

12. Write the working of Dynamic Host Configuration Protocol.

13. Why does WAP define its own security layer ?

14. Explain about record enumeration.

(4 × 3 = 12 weightage)

Part C

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

15. With suitable diagrams, explain multiplexing techniques.

16. Discuss about modulation methods used in GSM and UMTS.

17. What is Mobile IP ? Describe the mobile IP protocol.

18. Explain UI controls in detail.

(2 × 5 = 10 weightage)

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THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

(CBCSS)

Computer Science

CSS 3E 01 G—PRINCIPLES OF DATA ANALYTICS

(2020 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

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Section A (Short Answer)

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

1. List 6 Vs in Big Data.

2. Identify the skills required tor a data analyst.

3. What do you mean by an ideal data set ?

4. What is the role of database in data science ?

5. Give the key features of any *one* data visualization tool.

6. Differentiate between thick data and thin data. Give examples.

7. Identify and describe any *one* application of data science in day-to-day life.

(4 × 2 = 8 weightage)

Turn over

Section B (Short Essay)

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

8. Discuss advancements in ICT from a data science perspective.

9. Analyze the classification of data into structured, semi-structured and unstructured data.

10. Write a note on data evolution.

11. Analyze the roll of statistics and mathematics in data science.

12. Write a note on statistical prediction/modelling.

13. Explain the myths in big data.

14. Write a note on sources of big data.

(4 × 3 = 12 weightage)

Section C (Essay)

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

15. Describe the features and sources of spatial data and social network data. Identify the challenges in processing social network data.

16. Describe the relationship between data science, data analytics and big data analytics.

17. Give a detailed account of exploratory data analysis.

18. Analyze the process of data discovery in big data analytics. Discuss the different roles in big data analytics.

(2 × 5 = 10 weightage)

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THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

(CBCSS)

Computer Science

CSS 3E 01 F—NUMERICAL AND STATISTICAL METHODS

(2019 Admission onwards)

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 between absolute and relative errors. Find the absolute and relative errors of the approximation 125.67 to the value 119.66.

2. Explain algebraic equations with suitable example.

3. Explain Mutually Exclusive Events with suitable example.

4. Explain the two basic approaches that are employed for solving a system of linear equations.

5. What are the methods available for interpolation ?

6. Distinguish between ordinary and partial differential equations.

7. Explain any two methods of obtaining initial feasible solution for a transportation problem.

(4 × 2 = 8 weightage)

Section B

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

8. Find the truncation error in the result of the following function for $x = 1/5$ when we use (a) first three terms ; (b) first four terms ; and (c) first five terms :

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

9. Explain the basic principle used in Newton-Cotes method.

10. What are the three primitive numerical differentiation formulae ? Compare their truncation errors.

11. Solve the equation $x_1 - 3x_2 = 5, 3x_1 + x_2 = 5$ by the Gauss-Seidel method.

12. In a shipment of 25 microwave ovens, two are defective. If two ovens are randomly selected and tested, find the probability that both are defective if the first one is not replaced after it has been tested.

13. Given two points (x_1, y_1)) and (x_2, y_2), state the linear interpolation formula in terms of these points.

14. Find the initial feasible solution to the transportation problem using north west corner rule.

$(4 \times 3 = 12 \text{ weightage})$

Section C

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

15. Use Trapezoidal rule with $n = 4$ to estimate $\int_0^1 \frac{dx}{1+x^2}$ correct to five decimal places.   ~

16. Find the solution of $x^6 - 5x^2 y^2 + 1600 = 0$.
$$y^4 - 3x^4 y - 100 = 0$$

Take $(x, y) = (2, 3)$ as initial approximation. Use (a) Newton-Raphson method ; (b) Modified Newton-Raphson method.

17. Write an algorithm to Solve Linear Equation using Gaussian Elimination method.

18. Solve by simplex method :

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

subject to the constraints
$$3x_1 - x_2 + 3x_3 \le 7$$
$$-2x_1 + 4x_2 \le 12$$
$$-4x_1 - 3x_2 + 8x_3 \le 10$$
$$x_1, x_2, x_3 \ge 0.$$

$(2 \times 5 = 10 \text{ weightage})$

THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

·(CBCSS)

Computer Science

CSS 3E 01 E—COMPUTER OPTIMIZATION TECHNIQUES

(2019 Admission onwards)

Time : Three Hours 　　　　　　　　　　　　　　　　　　Maximum : 30 Weightage

General Instructions·

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Part A

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

1. Define Linear Programming.

2. Define sensitivity Analysis.

3. What is dual ? How will you find the dual of a given primal ?

4. Define a transportation model.

5. What is meant by critical path ?

6. Define integer linear programming.

7. What are travelling salesperson problems ?

(4 × 2 = 8 weightage)

Turn over

Part B

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

8. Solve the following LPP by graphical method

   Maximize $Z = 2x_1 + 3x_2$

   subject to

   $x_1 + x_2 \le 30$

   $x_2 \ge 3$

   $0 \le x_2 \le 12$

   $x_1 - x_2 \le 0$

   $0 \le x_1 \le 20$

9. Define network analysis. Differentiate between CPM and PERT.

10. Explain Vogel Approximation Method.

11. Define Dynamic Programming. Give its application. Which are the basis elements of a DP model ?

12. Explain Probabilistic EOQ Model.

13. Explain minimum spanning tree algorithms.

14. What are the steps of linear programming model formulation ?

$(4 \times 3 = 12$ weightage$)$

Part C

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

15. Solve by simplex method

    Maximise $Z = 5x_1 + 4x_2$
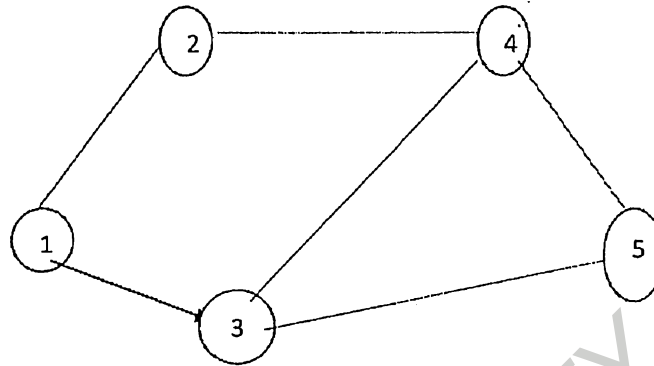
    subject to

    $6x_1 + 4x_2 \le 24$

    $x_1 + 2x_2 \le 6$

    $-x_1 + x_2 \le 1$

    $x_2 \le 2$

    $x_1, x_2 \ge 0$

16. For the network given below, find the shortest routes between every two nodes. The distances (in miles) are on the arcs. Arc (3, 5) is directional so that no traffic is allowed from node 5 to node 3. All the other arcs allow traffic in both directions.

17. Determine the critical path for the project network given below. All the durations are in days :

Activity	:	1-2	1-3	2-3	2-4	3-5	3-6	4-6	5-6
Duration	:	5	6	3	8	2	11	1	12

18. Explain General Inventory Model. Neon light on the U of A campus are replaced at the rate of 100 units per day. The physical plant orders the neon lights periodically. It costs $100 to initiate a purchase order. A neon light kept in storage is estimated to cost about $0.02 per day. The lead time between placing and receiving an order is 12 days. Determine the optimal inventory policy for ordering the neon lights.

(2 × 5 = 10 weightage)

THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

(CBCSS)

Computer Science

CSS 3E 01 D—BIOINFORMATICS

(2019 Admission onwards)

Time : Three Hours   Maximum : 30 Weightage

General Instructions

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Section A

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

1. Define RNA.

2. What is gene finding ?

3. Mention the applications of computational Biology.

4. What is PAM probability matrix ?

5. Define multiple sequence alignment.

6. Give examples for the tools of MSA.

7. Write a short note on EBI.

(4 × 2 = 8 weightage)

Turn over

Section B

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

8. What is sequence alignment ? Explain.

9. Describe string matching algorithms.

10. Describe about penalizing gaps.

11. Explain Phylogenetic algorithms.

12. What is protein sequence database ? Give examples.

13. Discuss Tool - Muscle.

14. Write about the analysis in SWISS genome database.

(4 × 3 = 12 weightage)

Section C

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

15. Give a detailed note on prokaryotes and eukaryotes.

16. Explain about Graph algorithms.

17. Write in detail about BLAST and FASTA.

18. Elaborate Nucleic acid sequence data bases.

(2 × 5 = 10 weightage)

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THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

(CBCSS)

Computer Science

CSS 3E 01 C—WEB TECHNOLOGY

(2019 Admission onwards)

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 the structure of an SGML applications.

2. Write the format of content model in DTD.

3. What are the various parts of SGML applications.

4. What is a URL ? Which are the important sections in a URL.

5. List various components of DOM in Javascript.

6. Write the steps to connect PhP with MySQL.

7. List the advantages and disadvantages of DHTML.

(4 × 2 = 8 weightage)

Turn over

Section B

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

8. What are Cookies ? Write a Java Script code to create cookies.

9. Write an HTML code to implement various listing tags.

10. Explain various events in JavaScript. Write a programme to implement event handling.

11. Write a code to implement frames and its attributes.

12. Write the difference between HTML and DHTML.

13. Explain the working of web servers.

14. Explain various data types in JavaScript.

(4 × 3 = 12 weightage)

Section C

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

15. a) Explain the features and importance of PhP.

    b) Explain various operators in PhP.

16. Explain in detail how Apache is configured as reverse proxy and Forward proxy.

17. a) Explain how to configure Apache to permit CGI.

    b) Explain LAMP and WAMP.

18) a) Explain the difference between XHTML and DHTML.

    b) Explain client side programming .Which are the various client side scripting languages

(2 × 5 = 10 weightage)

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THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

(CBCSS)

Computer Science

CSS 3E 01 A—COMPUTER GRAPHICS

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

General Instructions

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Section A

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

1. Define Aspect ratio.

2. Compare Splines and Curves.

3. What is a composting operation in texture mapping ?

4. What are the features in OpenGL ?

5. Compare CRT and DVST.

6. What is an aliasing technique ?

7. Write the steps to perform general pivot point rotation.

(4 × 2 = 8 weightage)

Section B

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

8. Compare boundary fill and flood fill.

9. How can we perform composite 2D transformations ?

Turn over

10. How can you map an object from window to view port ?

11. What are the parts of display processor in Graphic systems ?

12. Write the Digital Differential Analyzer algorithm.

13. Illustrate "Successive Scaling Operations are multiplicative".

14. How can you perform back face detection ?

(4 × 3 = 12 weightage)

Section C

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

15. Discuss any two display devices in detail.

16. Write an OpenGL program to draw a blue color filled triangle.

17. Illustrate the Bresenham's line drawing algorithm with an example.

18. Explain the Z-buffer algorithm.

(2 × 5 = 10 weightage)

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THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

(CBCSS)

Computer Science

CSS 3C 13—PRINCIPLES OF COMPILERS

(2019 Admission onwards)

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 finite automaton ?

2. Write about ambiguous grammar ? Give an example.

3. Mention the role of Lexical analyzer.

4. List out the various storage allocation strategies.

5. Give syntax - Directed translation for case statement.

6. Differentiate basic block and flow graph.

7. What is global data flow analysis ?

(4 × 2 = 8 weightage)

Turn over

Section B

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

8. Define the terms : Compiler, Interpreter and Translator.

9. How can you convert assignment statements into intermediate code ? Give example.

10. Write notes on Back patching.

11. Explain Peephole optimization and various code improving transformations.

12. Explain Register allocation and assignment with suitable example.

13. Describe the Need for Grouping of phases of compiler.

14. Elaborate about Generating code from DAG with suitable example.

$(4 \times 3 = 12$ weightage)

Section C

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

15. Write in detail about Compiler construction tools.

16. Explain Canonical LR parsers and LALR parsers.

17. Explain about Basic blocks with suitable example.

18. Give a detailed note on Boolean Expression.

$(2 \times 5 = 10$ weightage)

THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

(CBCSS)

Computer Science

CSS 3C 12—OBJECT ORIENTED PROGRAMMING CONCEPTS

(2019 Admission onwards)

Time : Three Hours   Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend* **all** *questions in each section.*

2. *The minimum number of questions to be attended from the Section/Part shall remain the same.*

3. *The instruction if any, to attend a minimum number of questions from each sub section/sub part/ sub division may be ignored.*

4. *There will be an overall ceiling for each Section/Part that is equivalent to the maximum weightage of the Section/Part.*

Section A

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

1. What do you mean by information hiding in object oriented programming ?

2. Define a message in object oriented programming.

3. What is the use of finalize method in java ?

4. What is an abstract class ?

5. How exception is different from semantic errors ?

6. What is a resultset in JDBC ?

7. What is a deployment diagram ?

(4 × 2 = 8 weightage)

Section B

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

8. Write the role of virtual machine in Java.

9. Write a short note on destructors in Java.

Turn over

10. Write the importance of threads in modern computing Paradigms.

11. How can we use the start() method in java applets ?

12. Illustrate activity diagram in UML with an example.

13. Write a short note on the facilities available in Java for network programming.

14. What is the use of throw statement in exception handling ?

(4 × 3 = 12 weightage)

Section C

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

15. Explain the features of Java in detail.

16. Explain how inheritance is implemented in Java, include properexamples in your explanation

17. Differentiate Java application program and Java applet with suitable examples.

18. Explain how events are managed in Java swing. Explain with a simple example.

(2 × 5 = 10 weightage)

THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

(CBCSS)

Computer Science

CSS 3C 11—ADVANCED DATABASE MANAGEMENT SYSTEMS

(2019 Admission onwards)

Time : Three Hours   Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend **all** questions in each section.*

2. *The minimum number of questions to be attended from the Section/Part shall remain the same.*

3. *The instruction if any, to attend a minimum number of questions from each sub section/sub part/ sub division may be ignored.*

4. *There will be an overall ceiling for each Section/Part that is equivalent to the maximum weightage of the Section/Part.*

Section A

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

1. What do you mean by hierarchical data models in DBMS ?

2. Define multivalued dependency.

3. Write the syntax of SQL statement for creating a table with fields name and district.

4. What is deadlock in transaction management ?

5. Write the need for Object Oriented Database Management Systems ?

6. What do you mean tuple relational calculus ?

7. What is the necessary condition to apply join operation between two tables ?

(4 × 2 = 8 weightage)

Turn over

Section B

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

8.   List the significance of DBMS over ordinary file system ?

9.   Write the importance of Boyce Codd normal form with an example.

10. Explain how the grouping of data from a Table can be done with the help of select command.

11. What do you mean by concurrency control in transaction management ? Explain how the deadlock is handled in it.

12. Write the properties of Object Oriented Database Management Systems over traditional DBMS.

13. Write the necessity of distributed database systems.

14. What is the importance creating a view in DBMS ?

(4 × 3 = 12 weightage)

Section C

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

15. Consider the tables customer, item and transaction. Draw the ER diagram for these tables with proper relationships.

16. What do you mean by stored procedure and triggers ? Explain how these two are related with a suitable example.

17. What are the threats in transaction management in DBMS ? How is it handled ?

18. Explain the importance of object oriented database management systems in advanced database management.

(2 × 5 = 10 weightage)

THIRD SEMESTER M.Sc. DEGREE (SUPPLEMENTARY) EXAMINATION NOVEMBER 2021

(CUCSS)

Computer Science

CSS 3E 05 C—SYSTEM SECURITY

(2014 to 2018 Admissions)

Time : Three Hours   Maximum : 36 Weightage

Part A

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

1. Differentiate between modification and fabrication.

2. What are the principles of information security ?

3. State the different types Non-malicious Program Errors.

4. Differentiate between transient and resident viruses.

5. Define relocation.

6. What are access control techniques ?

7. What is meant by inference ? Give an example.

8. What is meant by elementary integrity in a database ?

9. What is an incidence response plan ?

10. What is the purpose of organizational security ?

11. What are the corrective actions taken for maintaining the integrity of database ?

12. Specify the meaning of malicious code.

(12 × 1 = 12 weightage)

Part B

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

13. Explain vulnerability, threats, attacks and controls.

14. What are the three main goals of security ?

15. Illustrate the most Dangerous Software Errors.

Turn over

16. Differentiate between flaws, faults, and failures.

17. What is paging ? How can paging be used in combination with segmentation ?

18. Discuss the security methods of an operating system.

19. What is meant by sensitive data ? Give example.

20. Explain different types of disclosures in database.

21. Cite three controls that could have both positive and negative effects.

(6 × 2 = 12 weightage)

Part C

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

22. What are the controls against program threats ?

23. Discuss about various ways of memory address protection.

24. Analyse the need for the concurrency control Mechanisms.

25. Discuss the various types of security policies.

26. Explain the concepts of Security requirements for database systems in detail.

27. Explain Risk analysis in detail.

(3 × 4 = 12 weightage)

THIRD SEMESTER M.Sc. DEGREE (SUPPLEMENTARY) EXAMINATION NOVEMBER 2021

(CUCSS)

Computer Science

CSS 3C 03—OBJECT ORIENTED PROGRAMMING CONCEPTS

(2014 to 2018 Admissions)

Time : Three Hours   Maximum : 36 Weightage

Part A

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

1. What is polymorphism ?

2. What is JVM ?

3. Define the term class.

4. What is *new* operator ?

5. Define packages.

6. What is runnable interface ?

7. Distinguish between Thread and Process.

8. What are exceptions ?

9. Define Applets. Explain its different types.

10. What is JFrame ?

11. What is JDBC ?

12. What is UML ?

(12 × 1 = 12 weightage)

Part B

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

13. Explain the salient features of Java programming language.

14. Explain the use of *continue* statement in Java.

Turn over

15. Explain the differences between abstract class and interface in Java.

16. Explain how do you implement multiple inheritance in Java.

17. Explain the exception handling mechanism in Java.

18. Explain the steps involved in loading and running a remote applet.

19. What is Swing ? Explain how it differ from AWT.

20. What is socket ? Explain how it is implemented in Java.

21. What are the different types of statements supported by JDBC ? Explain any one.

(6 × 2 = 12 weightage)

Part C

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

22. Explain the basic principles of object orientation.

23. What are the various access specifiers for Java classes ? Explain.

24. Describe the life cycle of a thread in Java.

25. Give an account on AWT class and its hierarchy with suitable diagram.

26. Explain JDBC architecture with a diagram.

27. Write a Java program to add two time objects using suitable classes and methods.

(3 × 4 = 12 weightage)

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THIRD SEMESTER M.Sc. DEGREE (SUPPLEMENTARY) EXAMINATION NOVEMBER 2021

(CUCSS)

Computer Science

CSS 3C 02—PRINCIPLES OF COMPILERS

(2014 to 2018 Admissions)

Time : Three Hours

Maximum : 36 Weightage

Part A

Answer **all** *questions.*

Each question carries 1 *weightage.*

1. Define an Interpreter.

2. Compare Compiler with Translator.

3. Define a parse tree.

4. What is Ambiguity in context free grammars ?

5. How is break and continue statements used in backpatching ?

6. Write an expression for static assignment.

7. How can a GOTO statement be used for control flow ?

8. What is the purpose of an activation tree ?

9. Mention limitations of dynamic memory allocation.

10. List out memory hierarchy in compiler design.

11. When does a non-reducible flow graph expected in flow graphs ?

12. Define an induction variable for symbolic analysis.

(12 × 1 = 12 weightage)

Part B

Answer any **six** *questions.*

Each question carries 2 weightage.

13. What are the advantages in language-processing system if compiler produces assembly language rather than machine language ?

14. Differentiate between Deterministic and Non-Deterministic Finite automata.

15. What is operator presence in parsing ?

16. When is recursive descent parsing used ?

17. Describe an Indirect triple in compiler intermediate code generation.

18. Explain Type Equivalences in compiler design.

19. List the major issues complier manages during run time.

20. State the major steps of Region-based analysis algorithm.

21. When is region-based symbolic analysis required ?

(6 × 2 = 12 weightage)

Part C

Answer any **three** *questions.*

Each question carries 4 weightage.

22. Describe various phases of a compiler.

23. Illustrate with a diagram position of parser in compiler model.

24. Explain Error recovery strategies in syntax analysis.

25. With a Fibonacci program explain stack allocation of space.

26. Explain Heap management in compiler design.

27. With an example explain a Simple Target Machine model.

(3 × 4 = 12 weightage)

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THIRD SEMESTER M.Sc. DEGREE (SUPPLEMENTARY) EXAMINATION NOVEMBER 2021

(CUCSS)

Computer Science

CSS 3C 01—ADVANCED DATABASE MANAGEMENT SYSTEMS

(2014 to 2018 Admissions)

Time : Three Hours

Maximum : 36 Weightage

Part A

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

1. What do you mean by Data Independence ?

2. List the names of any two data models.

3. Define the term Foreign Key.

4. Name the relationship when it is maintained by two entities.

5. What is natural join ?

6. What is QBE ?

7. What is the use of triggers ?

8. Give any two DML commands in SQL.

9. What is Granularity ?

10. What do you mean by atomicity ?

11. What is distributed database management system ?

12. What is OODBMS ?

(12 × 1 = 12 weightage)

Part B

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

13. What is database management system ? Explain its advantages over file processing systems.

14. What is Relational Algebra ? Explain.

15. Explain the differences between INF and 2NF.

16. What is functional dependency ? Explain how it is useful for normalization of a relation.

Turn over

17. Explain the function and syntax *while* construct in MySQL.

18. What are stored procedures ? Explain how it is used within SQL queries.

19. What is concurrency control ? Explain its significance.

20. Explain two-phase locking mechanism.

21. Explain the concept of distributed database management system.

(6 × 2 = 12 weightage)

Part C

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

22. Explain the notational conventions used in the ER model.

23. Compare and contrast BCNF and 3NF.

24. Explain the function and syntax of any *two* control flow structures in MySQL with example.

25. Explain the ACID properties of transaction.

26. Consider the following schema :

    Custome(CID, Name, Sex)

    Contact(CID, Address, Phone, Email)

    Policy(CID, PolicyNo, PolicyType)

    Write SQL query for the following :

    (i)   Select all CID, Name having policy type = "Motor".

    (ii) Select all female customer have email end with *"gmail.com"*.

    (iii) Select name, address, phone for all male customers order by name.

    (iv) select all Name, Address, PolicyNo and PolicyType who posses PolicyType = "Health" and Sex = "M".

27. Explain the concept of Distributed Database System. Also list the advantages of Distributed Database System.

(3 × 4 = 12 weightage)

THIRD SEMESTER P.G. DEGREE EXAMINATION, NOVEMBER 2021
(CCSS)

Computer Science

CSC 3E 08—DIGITAL IMAGE PROCESSING

(2019 Admissions)

Time : Three Hours   Maximum : 80 Marks

Answer any **five** *full questions.*

1. A Discuss in detail about the relationship of pixels in an image.   (8 marks)

   B Describe the elements of visual perception.   (8 marks)

2. A Give an account on discrete Fourier Transformation and its properties.   (8 marks)

   B Explain K-L transform in detail.   (8 marks)

3. A Perform histogram equalization of the image :

Gray Level R_k :	0	1	2	3	4	5	6	7
No. of pixel P_h	6	8	11	12	3	5	15	6

   (8 marks)

   B Give an account on frequency domain filters.   (8 marks)

4. A Describe the filters used for noise removal from images.   (8 marks)

   B What is the objective of image segmentation ? Explain the role of thresholding techniques in image segmentation in detail.   (8 marks)

5. A Explain the fundamental concepts of image compression.   (8 marks)

   B Explain Huffman coding scheme results with image compression using suitable Example.

   (8 marks)

6. A Describe how the image is digitalized by sampling and quantization with illustration.

   (8 marks)

   B Explain run length encoding scheme with an example.   (8 marks)

7. A Give an account on smoothening and sharpening filters.   (8 marks)

   B Describe Walsh and Hadamard transformations.   (8 marks)

8. A Write a detailed note on boundary descriptors.   (8 marks)

   B Explain the image degradation/restoration process model with suitable diagram.   (8 marks)

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THIRD SEMESTER P.G. DEGREE EXAMINATION, NOVEMBER 2021

(CCSS)

Computer Science

CSC 3C 14—WEB TECHNOLOGY

(2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

Answer any **five** *full questions.*

1. A) Explain the salient features of SGML. (8 marks)

   B) Write a HTML code to design a web page to create a table with six rows and three columns for entering the marks of fifteen students. Assume suitable headings for each column. (5 marks)

   C) What is DTD ? (3 marks)

2. A) Discuss the application of regular expressions in Perl and list four regular expression modifiers and describe the effect of each on a pattern match.

   (8 marks)

   B) Write a Perl script to upload a file from your computer hard disk. (8 marks)

3. A) What is JSP ? Explain its scripting elements. (6 marks)

   B) Explain how database can be accessed from JSP with example. (10 marks)

4. A) Explain GET and POST method in PHP with examples. (8 marks)

   B) Write a PHP script to accept the name of any state from user and print the company name and all its branches in the state using the following relational tables :

   Company (CNo, CName, Region, State) and Branch (Bcode, Bname, City, CNo,)

   (8 marks)

5. A) Explain with examples *while* loop with *continue* and *break* statements in Python. (8 marks)

   B) Explain about exception handing mechanism in Python with example. (8 marks)

6. A) What is meant by DTD ? Explain the different types of DTD. (8 marks)

   B) What is CGI script ? Explain its use. Also write down the python CGI script to list out all the CGI Variables. (8 marks)

Turn over

7. A) Write a python program to describe different ways of deleting an element from the given List.

    B) Compare and contrast JSP declaration and JSP Scriplets.

                                                                        (8 + 8 = 16 marks)

8. A) Create a web page and PHP script to insert the details of student(like name, age, branch, semester, username, and password) to a database named *studentinfo* and table name *registration*. Also create login page and script to login using user name and password.

    B) Illustrate how to associate HTML form with CGI script.

                                                                        (12 + 4 = 16 marks)

D 11190

THIRD SEMESTER P.G. DEGREE EXAMINATION, NOVEMBER 2021

(CCSS)

Computer Science

CSC 3C 12—PRINCIPLES OF COMPILER DESIGN

(2019 Admissions)

Time : Three Hours   Maximum : 80 Marks

Answer any **five** *full questions.*

1. (A) Explain various applications of compiler technology.

   (B) Explain the functional differences between compiler, interpreter, and translator.

2. (A) Explain with necessary diagram role of parser in compilers.

   (B) Illustrate with examples the usage of recursive descent parsing.

3. (A) Describe three address code Instructions in intermediate code generation.

   (B) Explain different assignment statements used in intermediate code generation

4. (A) Write any *four* basic Machine Instruction Operations for code generation.

   (B) Explain the major issues addressed in the design of a code generator.

5. (A) Describe storage allocation strategies used for code optimization.

   (B) Explain abstraction and semilattice in data flow analysis.

6. (A) List and describe briefly commonly used compiler-construction tools.

   (B) Explain Interactions between the lexical analyser and the parser.

7. (A) Mention the typical procedure used for a nonterminal in a top-down parser.

   (B) Illustrate the concept of back patching with an example.

8. (A) Explain Peephole optimization in code generation.

   (B) Describe Runtime Memory procedure used in code and data areas for optimisation.