

D 31115

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Name.....

Reg. No.....

**THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)
EXAMINATION, NOVEMBER 2022**

(CBCSS)

Computer Science

CSS 3C 11—ADVANCED DATABASE MANAGEMENT SYSTEMS

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

Section A

Answer any four questions.

Each question carries 2 weightage.

1. What do you mean by network data models ?
2. Define normalisation.
3. Write the purpose of Alter table command in in SQL.
4. What is strict schedules in transaction management ?
5. What is database recovery ?
6. Identify the significance of cursors in DBMS?
7. What are triggers ?

(4 × 2 = 8 weightage)

Section B

Answer any four questions.

Each question carries 3 weightage

8. Write a short note on relational data models.
9. Illustrate lossless join with an example.
10. Write the use of Set command in SQL with an example.
11. List the properties of object oriented database management systems.
12. Compare Object Oriented Database Management Systems and DBMS.

Turn over

13. Write the disadvantages of Object Oriented Database Management Systems.
14. How can the select statement be used for pattern matching purpose ?

(4 × 3 = 12 weightage)

Section C

Answer any two questions.

Each question carries 5 weightage

15. Consider the table student, mark and school. Draw the ER diagram for these tables with proper relationships.
16. Explain how the second and third normal forms are different. Include sufficient examples in your explanation.
17. Elaborate on acid properties in transaction management.
18. Do you think that Object Oriented Database Management Systems and Distributed database systems are necessary in all the real life situations? Explain with suitable examples.

(2 × 5 = 10 weightage)

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**THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)
EXAMINATION, NOVEMBER 2022**

(CBCSS)

Computer Science

CSS 3C 12—OBJECT ORIENTED PROGRAMMING CONCEPTS

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

Section A

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

1. Define encapsulation in object oriented programming.
2. What is the use of this keyword in Java ?
3. What do you mean by Heavyweight Components ?
4. What is a frame in Java and AWT ?
5. What is the purpose of statements in JDBC ?
6. What is the use of 'super' keyword ?
7. What is polymorphism ?

(4 × 2 = 8 weightage)

Section B

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

8. Write the difference between while and do while statements.
9. What do you mean by dynamic method dispatch ?
10. Write the importance of packages in Java.
11. Write a method to implement multiple inheritance in Java.
12. Explain the different attributes of <applet> tag in HTML.

Turn over

13. What are the security features available in Java applets ?
14. Write the features of UML.

(4 × 3 = 12 weightage)

Section C

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

15. Explain the properties of object oriented programming in detail.
16. Write the importance of throw and throws statements in Java, explain with an example.
17. What is Java Swing ? Explain the advantages and disadvantages of it with examples.
18. Explain how the database can be accessed and processed in Java. Include a simple example in your explanation.

(2 × 5 = 10 weightage)

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**THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)
EXAMINATION, NOVEMBER 2022**

(CBCSS)

Computer Science

CSS 3C 13—PRINCIPLES OF COMPILERS

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

Section A

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

1. Define Compiler.
2. Mention the issues in a lexical analyzer.
3. What are the methods of representing a Syntax tree ?
4. What are the applications of DAG ?
5. Briefly explain dead code elimination.
6. What is peephole optimization ?
7. Write about Storage optimization.

(4 × 2 = 8 weightage)

Section B

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

8. Differentiate between lexeme, token and pattern.
9. What is an ambiguous grammar ? Give example.
10. Discuss the various issues in code generation with example.
11. What is data flow analysis ? Explain data flow abstraction with examples.

Turn over

12. Explain Principle Source of Optimization.
13. Explain DAG representation of the basic blocks with an example.
14. Discuss about token recognition using finite automata.

(4 × 3 = 12 weightage)

Section C

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

15. Write in detail about Cousins of Compilers.
16. Explain LR parsers and SLR parsers.
17. Explain the Runtime environment with suitable example.
18. Give a detailed note on Global data flow analysis.

(2 × 5 = 10 weightage)

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**THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)
EXAMINATION, NOVEMBER 2022**

(CBCSS)

Computer Science

CSS 3E 01 A—COMPUTER GRAPHICS

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

Section A

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

1. Compare LED and LCD display devices.
2. Write the significance of homogenous co-ordinates.
3. What is the purpose of rasterization ?
4. Define Projection.
5. What are the limitations of the floodfill algorithm ?
6. Write the function of display processor.
7. What is Clipping ?

(4 × 2 = 8 weightage)

Section B

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

8. How can you represent a spline ?
9. Write the composition matrix for performing a rotation after performing translation of a point.
10. Compare Shearing and Reflection with an example.
11. Illustrate the given statement "Successive Translations are Additive" with an example.

Turn over

12. Perform 60 degree counter clockwise rotation of a point P (1, 5) about a pivot point (2, 3). Find new point P.
13. What is hidden surface removal ?
14. What is the significance of vanishing points in projection ?

(4 × 3 = 12 weightage)

Section C

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

15. Write the Mid Point Circle drawing algorithm.
16. Describe any *two* methods for representing 3D objects.
17. Explain Hodgeman-polygon clipping algorithm.
18. Write the OpenGL program to draw a red colored rectangle.

(2 × 5 = 10 weightage)

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**THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)
EXAMINATION, NOVEMBER 2022**

(CBCSS)

Computer Science

CSS 3E 01 C—WEB TECHNOLOGY

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

Section A

Answer any four questions.

Each question carries 2 weightage.

1. List any four form controls in HTML.
2. Write any four features of javascript.
3. Write briefly on various approaches in web server architecture.
4. Write an HTML code using any two listing tags.
5. What is the importance of HTTP in web programming ?
6. What is proxy server ? What are its basic functions ?
7. List various operators in PHP.

(4 × 2 = 8 weightage)

Section B

Answer any four questions.

Each question carries 3 weightage.

8. Write an HTML code to implement various formatting tags with their attributes.
9. Explain architecture of Apache Webserver.
10. Explain JavaScript functions. Write a JavaScript code to find the cube of a number.
11. Compare the features of HTML and DHTML.
12. Explain server side scripting. Which are the tools used for it ? How it differ from client side scripting ?

Turn over

13. Create a biodata form using various HTML form controls.
14. Explain the features and importance of PHP.

(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 Apache Virtual Host ? Explain the steps to set it.
17.
 - a) What is CMS ?
 - b) Explain the important qualities of CMS.
 - c) Which are the different types of CMS ?
18. Explain basic security with Apache server.

(2 × 5 = 10 weightage)

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**THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)
EXAMINATION, NOVEMBER 2022**

(CBCSS)

Computer Science

CSS 3E 01—D. BIOINFORMATICS

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

Section A

Answer any four questions.

Each question carries 2 weightage.

1. Define Bioinformatics.
2. What is DNA ?
3. Mention the basic algorithms in computational Biology.
4. What is penalizing gaps ?
5. What do you mean by Dot-plot visualization.
6. Give examples for the tools of MSA.
7. Write a short note on NCBI.

(4 × 2 = 8 weightage)

Section B

Answer any four questions.

Each question carries 3 weightage.

8. Explain Amino Acids.
9. Discuss String matching algorithms.
10. What is PAM probability matrix ? Explain.
11. Write about Multiple sequence alignment.
12. What is nucleic acid sequence database ? Give examples.

Turn over

13. Explain Tool - T -Coffee.
14. Write about the analysis in Genbank protein database.

(4 × 3 = 12 weightage)

Section C

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

15. Explain about phylogeny, microarray analysis and homology.
16. Write in detail about Motif finding and tandem repeats.
17. Explain the concept of sequence alignment using Dynamic programming.
18. Describe Genome data bases.

(2 × 5 = 10 weightage)

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**THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)
EXAMINATION, NOVEMBER 2022**

(CBCSS)

Computer Science

CSS 3E 01—E.COMPUTER OPTIMIZATION TECHNIQUES

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

Section A

Answer any four questions.

Each question carries 2 weightage.

1. How will you solve a linear programming problem using graphical method ?
2. Explain primal and dual, its relationships and economic interpretations.
3. What is critical path method ?
4. How will you solve an assignment problem ?
5. Define revised simplex method.
6. Define integer linear programming and give its applications.
7. What is dual ? How will you obtain the dual form a given problem ?

(4 × 2 = 8 weightage)

Section B

Answer any four questions.

Each question carries 3 weightage.

8. Solve the following transportation problem using Vogel Approximation Method :

Warehouse/ Plant	W1	W2	W3	W4	Availability
P1	190	300	500	100	70
P2	700	300	400	600	90
P3	400	100	600	200	180
Requirement	50	80	70	140	

Turn over

9. Solve the assignment problem :

Job/ Contractors	A	B	C
1	17	25	31
2	10	25	16
3	12	14	11

10. Construct the project network comprised of activities A to L with the following precedence relationships :
- A, B and C the first activities of the project, can be executed concurrently.
 - A and B precede D.
 - B precedes E, F and H.
 - F and C precede G.
 - E and H precede I and J.
 - C, D, F and J precede K.
 - K precedes L.
 - I, G and L are the terminal activities of the project.
11. Explain cutting Plane Algorithm.
12. Explain Branch and Bound method in dynamic programming.
13. What is meant by post optimal analysis ?
14. Explain Probabilistic EOQ Model.

(4 × 3 = 12 weightage)

Section C

Answer any **two** questions.

Each question carries 5 weightage.

15. Solve the following LPP by dual simplex method

Minimize

$$Z = 2x_1 + x_2$$

Subject to

$$3x_1 + x_2 \geq 3$$

$$4x_1 + 3x_2 \geq 6$$

$$x_1 + 2x_2 \geq 3$$

$$x_1, x_2 \geq 0.$$

16. A project has the following time schedule :

Activity	1 - 2	1 - 3	1 - 4	2 - 5	3 - 6	3 - 7	4 - 6
Duration (Months)	2	2	1	4	8	5	3
Activity	5 - 8	6 - 9	7 - 8	8 - 9			
Durations (Months)	1	5	4	3			

Construct network and find the critical path and its durations.

17. What are transportation problem ? Explain the transportation algorithm and the various methods for finding the basic solution in detail.
18. What is meant by inventory model ? Explain static EOQ models and Dynamic EOQ models in detail.

(2 × 5 = 10 weightage)

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**THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)
EXAMINATION, NOVEMBER 2022**

(CBCSS)

Computer Science

CSS 3E 01 G—PRINCIPLES OF DATA ANALYTICS

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

Section A (Short Answer)

Answer any four questions.

Each question carries 2 weightage.

1. Identify any two developments in ICT that promoted the growth of data science.
2. Give examples for structured, semi-structured and unstructured data.
3. What do you mean by a time series data ? Give example.
4. Identify the relation between data science and machine learning.
5. Give a suitable example demonstrating the need for data cleaning.
6. Differentiate between data science and data analytics.
7. List any four Big Data myths.

(4 × 2 = 8 weightage)

Section B (Short Essays)

Answer any four questions.

Each question carries 3 weightage.

8. Reflect on the influence of data science on business.
9. Outline the different types of data used in data science. Give suitable examples.
10. Analyze the role of programming languages and databases in data science.
11. Identify the relation between data science and big data analytics.
12. Explain the need and the process of exploratory data analysis.

Turn over

13. Write a note on Data discovery.
14. Discuss evolution of Big Data.

(4 × 3 = 12 weightage)

Section C (Essay)

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

15. Discuss in detail different data sources and their features.
16. Discuss in detail the tools and techniques in data visualization.
17. Give a concise account of the steps in data science.
18. Discuss sources and characteristics of Big Data.

(2 × 5 = 10 weightage)

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**THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)
EXAMINATION, NOVEMBER 2022**

(CBCSS)

Computer Science

CSS 3E 02 B—WIRELESS AND MOBILE NETWORKS

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

Part A

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

1. Mention any four examples of wireless communication systems.
2. What you mean by MAC ?
3. How does a new Bluetooth device discover a Bluetooth network ?
4. What are the benefits of location information for routing in Adhoc networks ?
5. What is meant by route optimization ?
6. Briefly explain about Mobile IP.
7. Give a short note on persistent storage.

(4 × 2 = 8 weightage)

Part B

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

8. What is multiplexing ? Explain the different types of multiplexing techniques.
9. How are guard spaces realized between users in CDMA ?
10. Compare and contrast the infrared and radio transmissions.
11. Show the differences between 1G, 2G, 3G Cellular Networks.
12. Give the functions of various protocols used in application layer of TCP.

Turn over

13. Describe Wireless Session Protocol and Wireless Transaction Protocol.
14. Discuss about Hyper Text Transfer Protocol.

(4 × 3 = 12 weightage)

Part C

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

15. What is GSM ? What are its subsystems ? Explain the functions of each subsystem.
16. Write the working of Dynamic Host Configuration Protocol.
17. How security is enforced in WAP ? Explain.
18. Discuss events and event handling.

(2 × 5 = 10 weightage)

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**THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)
EXAMINATION, NOVEMBER 2022**

(CBCSS)

Computer Science

CSS 3E 02 C—CRYPTOGRAPHY AND NETWORK SECURITY

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

Part A

Answer any four questions.

Each question carries 2 weightage.

1. What do you mean by cryptanalysis ? Explain.
2. Give the short notes on AES.
3. What are the requirements for message authentication ?
4. Write the principles of public key cryptography.
5. Briefly explain TLS functions and alert codes of Transport Layer Security.
6. What are the different types of viruses ? How do they get into the systems ?
7. List and explain the three classes of intruders.

(4 × 2 = 8 weightage)

Part B

Answer any four questions.

Each question carries 3 weightage.

8. Discuss the concept of simplified DES.
9. Explain the major design principles of block cipher.
10. What are the major digital signature standards ? Explain.
11. How authentication is performed in Kerberos ?
12. Discuss the concept of IP security architecture.

Turn over

13. Give the taxonomy of malicious programs. Define each one.
14. What are the three common types of firewalls ? Explain.

(4 × 3 = 12 weightage)

Part C

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

15. Define threat and attack. Explain with examples.
16. Describe Hash functions in detail.
17. Explain the authentication services provided by X.509.
18. Discuss the format of an ESP(Encapsulating Security Payload) packet in IP security.

(2 × 5 = 10 weightage)

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**THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)
EXAMINATION, NOVEMBER 2022**

(CBCSS)

Computer Science

CSS 3E 02—D. ADVANCED WEB TECHNOLOGY

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

Section A

Answer any four questions.

Each question carries 2 weightage.

1. Mention the characteristics of Web 2.0.
2. Give a note on Dojo toolkit.
3. List out and explain the Web services.
4. Define Tuples.
5. Mention about Server Side programming.
6. Briefly explain the features of SQLite data types.
7. Give an example for the command SELECT.

(4 × 2 = 8 weightage)

Section B

Answer any four questions.

Each question carries 3 weightage.

8. Write about server side technologies Ruby and Perl.
9. Give a detailed note on Web service architecture.
10. Describe about digital signature.
11. Discuss about exception handling.
12. Write a note on Apache web server.

Turn over

13. Explain user defined functions.
14. Write about Insertion of Data using Python with example.

(4 × 3 = 12 weightage)

Section C

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

15. Elaborate Java Script framework with example.
16. Give a detailed note on Web service security.
17. Write in detail about Python installation.
18. Explain - Python functions for SQLite operations.

(2 × 5 = 10 weightage)

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**THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)
EXAMINATION, NOVEMBER 2022**

(CBCSS)

Computer Science

CSS 3E 02 E—VIRTUALIZATION AND CLOUD COMPUTING

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

Section A

Answer any four questions.

Each question carries 2 weightage.

1. List the properties of cloud computing.
2. What do you mean by Map Reduce computation ?
3. Compare SaaS and IaaS and give a simple example for each.
4. What is elasticity in cloud computing ?
5. What you mean by client ?
6. What are the mapping applications ?
7. What is the incident response ?

(4 × 2 = 8 weightage)

Section B

Answer any four questions.

Each question carries 3 weightage.

8. What you mean by virtualization and explain how will you implement storage virtualization at the server level ?
9. Explain the different types of hardware virtualization.
10. Design challenges of cloud architecture.
11. Explain the importance of Hadoop in cloud computing.
12. Write a short note on risk management in cloud.

Turn over

13. What do you mean by Public, Private and Hybrid clouds?
14. What are the benefits of using a cloud broker ?

(4 × 3 = 12 weightage)

Section C

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

15. Explain briefly the security concerns of cloud computing.
16. What do you mean by object storage, explain in detail ?
17. Describe NIST cloud computing reference architecture.
18. Discuss CPU virtualization.

(2 × 5 = 10 weightage)

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**THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)
EXAMINATION, NOVEMBER 2022**

(CBCSS)

Computer Science

CSS 3E 02 F—DATA WAREHOUSING AND MINING

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

Section A

Answer any four questions.

Each question carries 2 weightage.

1. What is metadata in data warehousing ?
2. Explain the purpose of data cleaning.
3. What do you mean by spatial data ?
4. List out the two measures of an association rule.
5. List the major issues in data mining.
6. What is model based clustering ?
7. What do you mean by ensemble method ? Give an example.

(4 × 2 = 8 weightage)

Section B

Answer any four questions.

Each question carries 3 weightage.

8. Explain data mining functionalities in brief.
9. Define the terms support and confidence.
10. Give an outline of the architecture of data warehouse.
11. What is Support Vector Machine (SVM) ?
12. Explain any clustering technique.

Turn over

13. How the prediction is different from classification ?

14. Write any two applications of web mining.

(4 × 3 = 12 weightage)

Section C

Answer any two questions.

Each question carries 5 weightage.

15. Explain the OLAP operations for multidimensional data with suitable examples.

16. Explain Baye's Theorem and Naïve Bayesian Classification.

17. What is constraint based association mining ? Explain its working for mining frequent item sets from Transactional databases.

18. Discuss the challenges in mining the World Wide Web, and explain the role of search engines.

(2 × 5 = 10 weightage)

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**THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY)
EXAMINATION, NOVEMBER 2022**

(CBCSS)

Computer Science

CSS 3E 02—G. MACHINE LEARNING

(2019 Admission onwards)

Time : Three Hours

Maximum : 30 Weightage

Section A (Short Answers)

Answer any four questions.

Each question carries 2 weightage.

1. Outline reinforcement learning.
2. Explain the concept of "Machine Learning" with an example.
3. Differentiate classification tree and regression tree.
4. Explain mixture density.
5. Illustrate the hierarchical clustering approach with a simple example.
6. Explain overfitting and underfitting.
7. In multilayer perceptron, what is the role activation functions ?

(4 × 2 = 8 weightage)

Section B (Short Essays)

Answer any four questions.

Each question carries 3 weightage.

8. Summarize any *three* applications of machine learning.
9. Outline the process of learning a class from examples.
10. Explain decision tree learning.
11. Analyze the steps in K means clustering.
12. Analyze K-Armed Bandit problem.

Turn over

13. Explain K-fold cross validation.
14. Examine any *two* non-linear activation functions.

(4 × 3 = 12 weightage)

Section C (Essays)

Answer any two questions.

Each question carries 5 weightage.

15. Explain basic concepts in Bayesian learning and the working of Bayesian classifier. Identify advantages and limitations of Bayesian learning.,
16. Discuss Linear Discriminant analysis as a method for dimensionality reduction.
17. Discuss temporal difference learning.
18. Explain the working of an artificial neuron. Give a general architecture of multilayer neural network. Discuss steps in backpropagation algorithm.

(2 × 5 = 10 weightage)

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THIRD SEMESTER P.G. DEGREE EXAMINATION, NOVEMBER 2021

(CCSS)

Computer Science

CSC 3E 16—DATA ANALYTICS WITH PYTHON

(2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

Answer any five full questions.

1. (A) What are the skills required for a data scientist ? Briefly explain. (8 marks)
(B) Illustrate the role of a data scientist. (8 marks)
2. (A) Explain the various characteristics of python which differentiates it with other programming languages. (8 marks)
(B) "Python libraries are very powerful for data manipulation". Elucidate the statement. (8 marks)
3. (A) Briefly explain the concept of generalization of data using machine learning. (8 marks)
(B) Explain the procedure for building predictive model using machine learning. (8 marks)
4. (A) What is classification? Briefly explain the different classification algorithm available in machine learning. (8 marks)
(B) Explain the performance evaluation measures used in machine learning. (8 marks)
5. (A) Analyse a problem with suitable example. Evaluate the same with respect to its dataset, data analysis, modelling and evaluation. (12 marks)
(B) Differentiate cross validation from hold out validation. (4 marks)
6. (A) Briefly explain the usage of standard library in Python with example. (8 marks)
(B) Differentiate classification and Regression with an example. (8 marks)

Turn over

7. (A) Illustrate the usage of function and modules in python. (8 marks)
(B) Briefly explain the different visualization libraries available in Python. (8 marks)
8. (A) Explain the different technologies used in data analytics. (8 marks)
(B) Briefly explain the following: (8 marks)
- (a) Dimensionality reduction. (b) Model evaluation.

[5 × 16 = 80 marks]

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