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Question Paper Code :AD3032

M.C.A. (2 Years) DEGREE EXAMINATIONS, FEBRUARY/MARCH 2024.

Third Semester

Elective – III

DMC 6018 – DATA MINING AND DATA WAREHOUSING TECHNIQUES

(Regulations 2018)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List the different types of data in data mining.
2. What is meant by binning?
3. What is the need of association rule mining?
4. Define feature selection technique.
5. Is regression technique follows supervised learning? Justify
6. Define the terms : training and test data.
7. What is meant by unsupervised learning?
8. List the different types of data distance measures.
9. What is meant by data mart?
10. Define meta data.

PART B — (5 × 13 = 65 marks)

11. (a) Differentiate data base and data mining with examples.

Or

- (b) Explain about the data transformation process and the steps involved in it.

- (a) Discuss about the FP growth algorithm without candidate key generation with suitable example.

Or

- (b) List the differences and limitations in classification and prediction techniques.

- (a) Explain the concept of hyper plane in SVM classifier with example.

Or

- (b) Describe simple decision tree algorithm with an example.

- (a) Explain about outlier detection and its importance.

Or

- (b) Explain simple k-means and k-medoids algorithms with suitable examples.

- (a) Explain the need of multidimensional data model with neat sketches.

Or

- (b) Explain in detail about basic data ware house architecture and its functionalities.

PART C — (1 × 15 = 15 marks)

Elucidate the following :

- (i) Histogram analysis (8)
(ii) Market basket analysis (7)

Or

- (b) Write the note on the following :

- (i) Fuzzy clustering (8)
(ii) OLAP architecture (7)

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Question Paper Code : AD3043

M.C.A. (2 Yrs) DEGREE EXAMINATION, FEBRUARY/MARCH 2024.

Third Semester

Elective – III

DMC 6029 – BIG DATA PROCESSING

(Regulations 2018)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the characteristics of Big data?
2. Why YARN is an ideal choice for running distributed applications?
3. Outline the difference between classification and clustering.
4. State Bayes' theorem.
5. What is market basket analysis?
6. Define a hybrid recommendation system.
7. What is a data stream?
8. Define a decaying window.
9. What is schemaless database?
10. Define sharding.

PART B — (5 × 13 = 65 marks)

11. (a) What is big data? Outline the characteristics of big data applications. (13)
Or
(b) Outline the steps to calculate how many times each word is repeated across ' n ' sentences using the MapReduce framework with an example ($n = 6$). (13)

12. (a) What is a decision tree? Outline the steps in classification using decision tree with an example. (13)

Or

- (b) Outline the steps in Naïve Bayes classification with an example. (13)

13. (a) Apply the Apriori algorithm for discovering frequent item sets to the following data set:

Transaction ID	Items Purchased
101	Mulberry, Plum, Carambola, Fig, Lychee, Avocado
102	Mulberry, Plum, Carambola
103	Carambola, Fig, Lychee
104	Mangosteen, Redcurrant, Carambola, Fig, Lychee
105	Mangosteen, Redcurrant, Pear, Kiwi
106	Mulberry, Plum, Carambola
107	Pear, Kiwi
108	Mulberry, Plum, Carambola
109	Custard Apple
110	Pear, Kiwi

Use 0.3 for the minimum support value. (13)

Or

- (b) Draw the framework for a content based recommendation system and present an outline of the same. (13)

14. (a) Outline the architecture of stream data model with a diagram (13)

Or

- (b) What is sentiment analysis? Draw a framework for real time sentiment analysis and present an outline of the same. (13)

15. (a) What is a NoSQL database? Outline the features of NoSQL databases. (13)

Or

- (b) What is graph database? How data is organized in a graph database? Outline with an example. (13)

PART C — (1 × 15 = 15 marks)

16. (a) Consider five points $\{x_1, x_2, x_3, x_4, x_5\}$ with the following coordinates as a two-dimensional sample for clustering:

$$x_1 = (1.5, 2.75), x_2 = (2.25, 3.25), x_3 = (2.75, 1.25), x_4 = (5, 2), x_5 = (7, 4).$$

Illustrate the K -means algorithm on the above data set. The required number of clusters is two and initially, clusters are formed from random distribution of samples: $C_1 = \{x_1, x_2, x_4\}$ and $C_2 = \{x_3, x_5\}$.

Or

- (b) Formulate how big data analytics helps business people to increase their revenue. Discuss with one real time application.
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Question Paper Code : AD3033

M.C.A. (2 Years) DEGREE EXAMINATION, FEBRUARY/MARCH 2024.

Third Semester

Elective – IV

DMC 6019 — DATA VISUALIZATION TECHNIQUES

(Regulations 2018)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Why is data visualization important?
2. What is meant by DPA?
3. Define the term raster.
4. What is meant by three dimensionality?
5. Write about range distortion?
6. What is meant by stacked bar charts?
7. What is the difference between reports and dashboards?
8. Write about business dashboards?
9. Define the term ‘word cloud’.
10. List any three data visualization tools.

PART B — (5 × 13 = 65 marks)

11. (a) Describe the steps in data visualization process.

Or

- (b) Explain the various types of charts in data visualization.

12. (a) Explain about eight visual variables and its functions.

Or

(b) Explain the following :

(i) Georeferencing (6)

(ii) Geocoding. (7)

13. (a) Explain the steps involved in data Visualization design process.

Or

(b) Describe about Keys, Labels, and Legends in graphs with example.

14. (a) Explain about benefits and applications of using dash boards.

Or

(b) Explain the study of sales dashboard with suitable examples.

15. (a) Explain about importance and features of text visualization.

Or

(b) Explain about issues in cognitive and perception of visualization systems.

PART C — (1 × 15 = 15 marks)

16. (a) Explain the following

(i) Importance of information processing in visualization. (5)

(ii) Point, Line, and area Generalization. (5)

(iii) Importance of Aesthetics. (5)

Or

(b) Write about the following

(i) Issues in visualization hardware. (5)

(ii) Visualization tool kit. (5)

(iii) Research directions in visualization. (5)

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Question Paper Code : AD3014

M.C.A. (2 Years) DEGREE EXAMINATION, FEBRUARY/MARCH 2024.

Third Semester

DMC 6303 — ACCOUNTING AND FINANCIAL MANAGEMENT FOR
APPLICATION DEVELOPMENT

(Regulations 2018)

Maximum : 100 marks

Time : Three hours

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is the primary purpose of accounting?
2. Which financial statement provides a snapshot of a company's financial position at a specific point in time?
3. What is the formula for calculating the net profit (or net ass) on an income statement?
4. What is the purpose of preparing final accounts in business?
5. What is a partnership agreement in the context of partnership accounts?
6. Write the concept of partnership deed' in partnership accounts.
7. What is depreciation in accounting, and why is it important for businesses?
8. What are the two common methods used to calculate depreciation, and how do they differ?
9. Mr. Smith started a small business and recorded the following transactions during the month of January 2023:
He invested Rs. 5,000 of his savings into the business.
He paid Rs. 800 for rent.
He sold goods for Rs. 3,000, receiving Rs. 2,000 in cash, and the rest will be paid later. Explain the single entry accounting entries for Mr. Smith's transactions in January 2023.
10. What is a single entry account?

PART B — (5 × 13 = 65 marks)

11. (a) Explain the important accounting principles and standards?

Or

- (b) Describe the key components of the accounting equation.

12. (a) Explain the importance of preparing final accounts in business, and outline the key components of a final accounts statement.

Or

- (b) The following trial balance is given for XYZ Company on December 31, 2022:

Debit Balance: Cash Rs. 10,000, Accounts Receivable Rs. 15,000, Prepaid Expenses Rs. 2,000, Land and Buildings Rs. 50,000, Equipment Rs. 25,000, Accumulated Depreciation Rs. 5,000, Accounts Payable Rs. 8,000, and Loan Payable Rs. 20,000.

Credit Balance: Sales Revenue Rs. 60,000, Cost of Goods Sold Rs. 28,000, Salaries Expense Rs. 7,000, Rent Expense Rs. 4,000, and Income Tax Expense Rs. 1,000.

Prepare the Income Statement and Statement of Financial Position (Balance Sheet) for XYZ Company as of December 31, 2022.

13. (a) Explain the concept of "Goodwill" in partnership accounts and how it is treated in the final accounts of a partnership firm.

Or

- (b) Sameer and Yasmin are partners with capitals of Rs. 15,00,000 and Rs. 10,00,000 respectively. They agree to share profits in the ratio of 3:2. Show how the following transactions will be recorded in the capital accounts of the partners in case:

- (i) the capitals are fixed, and
(ii) the capitals are fluctuating. The books are closed on March 31, every year.

Particulars	Sameer	Yasmiri
	(Rs.)	(Rs.)
Additional capital contributed on July 1, 2022	3,00,000	2,00,000
Interest on capital	5 %	5 %
Drawings (during 2014-15)	30,000	20,000
Interest on drawings	1,800	1,200
Salary	20,000	
Commission	10,000	7,000
Share in loss for the year 2022-23	60,000	40,000

14. (a) Explain the factors affecting the depreciation.

Or

- (b) On April 1, 2020, a company purchases machinery worth 1,00,000. On October 1, 2022, it purchased additional machinery worth 20,000 and spends 2,000 on its erection. The accounts are closed each year on March 31. Assuming the annual depreciation to be 10%, show the Machinery Account for 5 years under the straight line method.

15. (a) Difference between Single Entry System and Double Entry System.

Or

- (b) Compute the amount of total purchases and total sales of Mr. Amit from the following information for the year ending on March 31, 2017.

	Amount
Total debtors as on April 01, 2016	40,000
Total creditors as on April 01, 2016	50,000
Bills receivable as on April 01, 2016	30,000
Bills payable as on April 01, 2016	45,000
Discount received	5,000
Bad debts	2,000
Return inwards	4,000
Discount allowed	3,000

PART C — (1 × 15 = 15 marks)

16. (a) Critically examine the different methods of depreciation.

Or

- (b) From the following information prepare financial statements of ABC Ltd. for the year ending 31, March 2022.

Trial Balance

(As on 31st March 2022)

Particulars	Dr.	Cr.
	(Rs.)	(Rs.)
Stock	6,80,000	
Furniture and fixture	5,00,000	
Discount allowed	40,000	
Loan to directors	80,000	
Bad debts	35,000	

Particulars	Dr. (Rs.)	Cr. (Rs.)
Advertisement	20,000	
Purchases	23,19,000	
Commission	1,20,000	
Plant and machinery	8,60,000	
Rent	25,000	
Current account with bank	45,000	
Cash in hand	8,000	
Interest on bank loan	1,16,000	
Preliminary expenses	10,000	
Wages	9,00,000	
Consumables	84,000	
Freehold land	15,46,000	
Tools and equipment	2,45,000	
Goodwill	2,65,000	
Debtors	2,87,000	
Bills receivable	1,53,000	
<i>Dealer aids</i>	21,000	
Insurance premium (Marine)	30,000	
Trade expenses	72,000	
Distribution freight	54,000	
Debenture interest	20,000	
Equity Capital (Shares of Rs. 10 each)	25,00,000	
11% Debentures	5,00,000	
Bank loan	45,000	
Bills payable	25,000	
Creditors	1,56,000	
Sales	42,68,000	
Rent received	46,000	
Transfer fees	10,000	
Profit and loss account	1,39,000	
Accumulated depreciation—machinery	46,000	

The Closing Stock valued as on 31, March 2022 is Rs. 8,23,000.

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Question Paper Code : AD3012

M.C.A. (2 Years) DEGREE EXAMINATION, FEBRUARY/MARCH 2024.

Third Semester

DMC 6301 – DATA SCIENCE

(Regulations 2018)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

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PART A — (10 × 2 = 20 marks)

1. List any two risks involved in big data.
2. Relate big data and data science.
3. Define Skewness and Kurtosis.
4. Differentiate linear and logistic regression.
5. State the purpose of Bayesian networks.
6. List any two applications of Neuro Fuzzy modelling.
7. Name any two widely used data analytical frameworks.
8. State the purpose of Apache Sqoop.
9. Give any two examples of streaming data.
10. What is Bloom filter?

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PART B — (5 × 13 = 65 marks)

11. (a) (i) What is exploratory data analysis? State its benefits. (7)
(ii) List any five disadvantages of data visualisation. (6)

Or

- (b) (i) Define Big data. Discuss its properties. (7)
(ii) Explain Central limit theorem using suitable example and diagram. (6)

12. (a) (i) Given population data for five regions. visualise using three types of plots. (7)

(ii) Explain Correlation analysis in detail. (6)

Or

(b) (i) Explain the purpose of bar graph, scatter plot and histogram using suitable diagram. (7)

(ii) Given the mark obtained by a set of students in maths exam, perform Univariate analysis. (6)

13. (a) (i) Compare RDBMS and MongoDB. (7)

(ii) Explain Support Vector Machine briefly. (6)

Or

(b) (i) Explain Principal Component Analysis in detail. (7)

(ii) Explain how data modelling is achieved in HBase. (6)

14. (a) (i) Explain Hadoop architecture and its components with proper diagram. (7)

(ii) Explain MapReduce in detail. (6)

Or

(b) (i) Explain the creating, dropping and altering databases using Apache Hive. (7)

(ii) Explain Spark in detail. (6)

15. (a) (i) Explain decaying window algorithm. (7)

(ii) Explain with a neat diagram the stream data model and its architecture. (6)

Or

(b) Explain any one algorithm to count number of distinct elements in a Data stream using suitable example. (13)

PART C — (1 × 15 = 15 marks)

16. (a) The sales of a company in lakhs for the year 2001-2010 are given below. Perform all possible analytics on the given data and list your inferences.

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sales	550	520	555	585	540	525	545	585	565	540
	1 6 8 7 9	6 7 9 3 2	8 Or 3 2 5	2 5 10 8 4	5 1 7 8 4					
	6 6 7 9 3	7 9 3 2 5	9 Or 3 2 5	2 5 10 8 4	5 1 7 8 4					

- (b) Perform linear regression for the given data. Add regression line to the scatterplot and show the result.

X	Y
95	85
85	92
80	70
70	62
60	70

Question Paper Code : AD3024

M.C.A. (2 Yrs) DEGREE EXAMINATION, FEBRUARY/MARCH 2024

Third Semester

Elective – II

DMC 6010 — WEB DESIGN

(Regulations 2018)

Maximum : 100 marks

Time : Three hours

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define Internet
2. What is W3C?
3. Define HTML
4. What are Cascading Style Sheets (CSS)?
5. Define CSS positioning.
6. What is responsive web design?
7. Define JavaScript.
8. What is the Document Object Model (DOM) in JavaScript?
9. Define PHP.
10. What are sessions in PHP?

PART B — (5 × 13 = 65 marks)

11. (a) Discuss the brief history of the Internet and its evolution into the World Wide Web.

Or

- (b) Discuss the five Golden rules of Web Designing and their significance in creating user-friendly web interfaces.

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12. (a) Describe the structure of HTML documents and the basic markup tags used in web development

Or

- (b) Explain the basic CSS selectors and properties, including text formatting and color manipulation.

13. (a) Discuss the use of floats, z-index and Flexbox layouts for creating responsive web designs.

Or

- (b) Discuss advanced CSS effects such as gradients, opacity and box-shadow.

14. (a) Explain JavaScript objects, JSON and the Document Object Model (DOM).

Or

- (b) Describe JavaScript events and input validation techniques.

15. (a) Explain the basic syntax of PHP and how it interacts with HTML to manage form submissions and process user input.

Or

- (b) Discuss the use of cookies, sessions and file handling in PHP.

PART C — (1 × 15 = 15 marks)

- (a) Explain how hyperlinks, images, tables and lists are implemented in HTML documents.

Or

- (b) Explain how PHP interacts with MySQL databases to store and retrieve data and the role of WAMP and PHPMyAdmin in PHP development.

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Question Paper Code : AD3013

M.C.A. (2 Years) DEGREE EXAMINATION, FEBRUARY/MARCH 2024.

Third Semester

DMC 6302 – EMBEDDED SYSTEM AND INTERNET OF THINGS

(Regulations 2018)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Identify any two advantages of embedded processors.
2. Distinguish between external ROM and RAM.
3. Expand RTOS with its uses.
4. State the need of interfacing with i/o devices.
5. List any three levels of IOT with an example.
6. Specify the benefits of power sources.
7. Outline the characteristics of web services.
8. Summarize the vulnerabilities for hacking of API.
9. Analyze the reason for having cloud storage.
10. Examine the types of analytics involved in real time applications.

PART B — (5 × 13 = 65 marks)

11. (a) Outline the following with a suitable example. (7)
(i) PSW and Flag Bits
(ii) Pins of 8051 (6)

Or

- (b) Explain any two types of memory address decoding methods used in 8051. Give an example.

12. (a) Illustrate in detail about the priority-based scheduling Policies. Discuss its principles with a real time scenario.

Or

- (b) Explain in detail about programming embedded systems in C. Give example.

13. (a) Discuss about the IOT protocols with its characteristics. Analyze the challenges in with different layers.

Or

- (b) Describe the following in detail

(i) Sensors and actuators (6)

(ii) IOT versus M2M (7)

14. (a) Explain the technologies available for the design of building IOT applications. Give example.

Or

- (b) Illustrate with an example how the integration with Arduino is deployed. Explain in detail.

15. (a) Discuss in detail about Mini web service architecture with a neat diagram. List the challenges of Microservices.

Or

- (b) Describe the following in detail

(i) Intrusion Detection Detectors (6)

(ii) Complete design of Embedded systems. (7)

PART C — (1 × 15 = 15 marks)

5. (a) Explain the necessity of adopting IoT technology for a growing need to increase customer loyalty and deliver the best in-store experience by retail sector smart parking.

Or

- (b) Illustrate the development of context switching using its architecture.