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**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA**  
(An Autonomous Institute Affiliated to AKTU, Lucknow)

**MCA**

**SEM: III - THEORY EXAMINATION (2025 - 2026)**

**Subject: Advanced Concepts Of Analytics**

**Time: 3 Hours**

**Max. Marks: 100**

General Instructions:

IMP: Verify that you have received the question paper with the correct course, code, branch etc.

1. This Question paper comprises of three Sections -A, B, & C. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.

2. Maximum marks for each question are indicated on right -hand side of each question.

3. Illustrate your answers with neat sketches wherever necessary.

4. Assume suitable data if necessary.

5. Preferably, write the answers in sequential order.

6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

**SECTION-A**

20

1. Attempt all parts:-

1-a. Data integrity refers to: (CO1, K1)

1

- (a) Speed of data processing
- (b) Accuracy, consistency, and reliability of data
- (c) Amount of data stored
- (d) Cost of data storage

1-b. Importance of data integrity includes: (CO1, K2)

1

- (a) Reducing data storage costs
- (b) Building trust and ensuring compliance
- (c) Increasing data volume
- (d) Eliminating need for data analysis

1-c. The main objective of data cleaning involves:(CO2, K2)

1

- (a) Increasing data volume
- (b) Improving data quality
- (c) Data visualization
- (d) Data storage

1-d. Exploring raw data typically starts with:(CO2,K1)

1

- (a) Analyzing results
- (b) Identifying data types
- (c) Cleaning data
- (d) Storing data

1-e. Data visualization primarily helps in:(CO3,K2)

1

- (a) Storing data
  - (b) Analyzing data
  - (c) Communicating data insights
  - (d) Creating databases
- 1-f. A key benefit of using visualizations is:( CO3,K2) 1
- (a) Complexity
  - (b) Clarity
  - (c) Length
  - (d) Ambiguity
- 1-g. Power BI is primarily used for:(CO4, K2) 1
- (a) Word processing
  - (b) Data visualization
  - (c) Audio editing
  - (d) Graphic design
- 1-h. Which file format can be imported directly into Power BI? ( CO4,K2) 1
- (a) .txt
  - (b) .docx
  - (c) .jpg
  - (d) All of the above
- 1-i. Big Data has evolved primarily due to advancements in:(CO5, K2) 1
- (a) Cloud computing
  - (b) Data storage
  - (c) Technology and connectivity
  - (d) All of the above
- 1-j. In the context of Big Data, "Data as Economy" refers to:(CO5, K2) 1
- (a) The value of data in financial markets
  - (b) Data being a resource for business insights
  - (c) Data as currency in transactions
  - (d) The cost of storing data

2. Attempt all parts:-

- 2.a. Describe the benefits of balancing operational objectives with data integrity in a company.(CO1, K2) 2
- 2.b. Noise in data collected from equipment can distort results. Explain how filtering techniques can mitigate this issue.(CO2,K3) 2
- 2.c. Explain the importance of data visualization.(CO3,K2) 2
- 2.d. Describe the features of Power BI in detail.(CO4,K2) 2
- 2.e. Differentiate between structured and unstructured data. (CO5,K4) 2

## **SECTION-B**

30

3. Attempt all parts:-

3.a. Answer any one of the following:-

3.a.(i)	Explain the concept of data integrity and its critical role in organizational success. Include examples of how data integrity impacts decision-making.(CO1, K1)	6
3.a.(ii)	Discuss three key factors contributing to poor data integrity within organizations. Include potential solutions for each factor.(CO1,K3)	6
3.b.	Answer any one of the following:-	
3.b.(i)	Explain the process of data cleaning using SQL and its significance in preparing data for analysis. Include key steps involved.(CO2, K2)	6
3.b.(ii)	Discuss the challenges associated with missing values in datasets. Apply common imputation techniques in SQL with example.(CO2,K3)	6
3.c.	Answer any one of the following:-	
3.c.(i)	Demonstrate the significance of data visualization using python in the context of data-driven decision-making. Include examples of how visualizations can enhance understanding.(CO3, K3)	6
3.c.(ii)	Write a Python program to plot a line graph showing monthly sales of a company.(CO3,K4)	6
3.d.	Answer any one of the following:-	
3.d.(i)	Discuss the primary functions of Power BI in data analysis.(CO4, K2)	6
3.d.(ii)	Explain the steps involved in importing data from flat files into Power BI and also explain data transformation steps.( CO4,K2)	6
3.e.	Answer any one of the following:-	
3.e.(i)	Discuss the significance of Big Data in today's economy considering 6 V's. (CO5, K2)	6
3.e.(ii)	Demonstrate the evolution of Big Data technologies and their impact on data management.(CO5, K3)	6
<b>SECTION-C</b>		<b>50</b>
4.	Answer any <u>one</u> of the following:-	
4-a.	Examine the challenges faced during the integration of data from multiple sources. Discuss strategies to overcome these challenges and ensure consistent, high-quality data. (CO1,K3)	10
4-b.	Analyze the role of data validation techniques in maintaining data integrity. Discuss the specific methods used in spreadsheets and their effectiveness in preventing errors.(CO1, K3)	10
5.	Answer any <u>one</u> of the following:-	
5-a.	Assess the effects of redundancy in datasets, highlighting how it can lead to inaccurate conclusions and inefficient data management. Propose strategies for minimizing redundancy.(CO2,K2)	10
5-b.	Evaluate the role of exploratory data analysis (EDA) in understanding data characteristics. Discuss various techniques used in EDA and their contributions to informed decision-making.(CO2,K2)	10
6.	Answer any <u>one</u> of the following:-	
6-a.	Elaborate the importance of data visualization in contemporary data analysis. Discuss its role in enhancing comprehension and facilitating decision-making.(CO3,K2)	10

- 6-b. A company wants to analyze its sales performance in four regions: North, South, East, and West, over a 12-month period. Each region has a separate CSV file. Write a Python program that: 10
1. Reads all four datasets and merges them.
  2. Creates a **4-subplot figure** comparing: Monthly revenue trends for each region. (CO3,K4)
7. Answer any one of the following:-
- 7-a. Describe the key features of Power BI and their significance in data analysis.(CO4,K2) 10
- 7-b. Illustrate the process of loading and transforming data in Power BI Desktop and the importance of this step. Also explain the importance of dashboard. (CO4, K3) 10
8. Answer any one of the following:-
- 8-a. Explain the objectives of predictive analytics and its role in future decision-making.(CO5, K2) 10
- 8-b. Discuss the importance of prescriptive analytics in business operations and decision support.(CO5, K2) 10