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Printed Page:-3 **Subject Code:- AMICA0811**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)
MCA (Integrated)
SEM: VIII - THEORY EXAMINATION (2025 - 2026)
Subject: Programming for Data 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:-

(1.1) Big Data refers to? (CO1, K1) 1

(a) Small datasets
(b) Large and complex datasets
(c) Only images
(d) Only numbers

(1.2) Reporting focuses on? (CO1, K1) 1

(a) Past data
(b) Future prediction
(c) Data modeling
(d) AI

(1.3) Plotly is best known for? (CO2, K1) 1

(a) Static plots
(b) Interactive visualization
(c) File handling
(d) ML

(1.4) Aggregation functions include? (CO2, K1) 1

(a) sum()
(b) merge()
(c) reshape()
(d) plot()

(1.5) What is BSON in MongoDB? (CO3, K1) 1

(a) Binary JSON
(b) Basic SQL Object
(c) Binary SQL Notation
(d) Basic JSON

(1.6) Which method executes multiple SQL statements? (CO3, K1) 1

(a) executeAll()
(b) executescript()
(c) multiExecute()
(d) runAll()

(1.7) A tensor is? (CO4, K1) 1

(a) Scalar
(b) Vector
(c) Matrix
(d) All of these

(1.8) Loss function measures? (CO4, K1) 1

(a) Speed
(b) Error
(c) Memory
(d) Data

(1.9) The role of generator in GAN is to: (CO5, K1) 1

(a) Classify data
(b) Generate fake data
(c) Train model
(d) Evaluate results

(1.10) In RL, agent interacts with: (CO5, K1) 1

(a) Dataset
(b) Environment
(c) Model
(d) Layer

2. Attempt all parts:-

(2.1) Design a simple data analytics lifecycle for a business problem. (CO1, K6) 2

(2.2) Show how to merge two DataFrames using Pandas. (CO2, K3) 2

(2.3) Differentiate between updateOne() and updateMany() in MongoDB. (CO3, K4) 2

(2.4) Compare LSTM and GRU in terms of performance. (CO4, K4) 2

(2.5) Explain how deep reinforcement learning improves decision-making. (CO5, K2) 2

SECTION-B 30

Answer any one of the following:-

(3.1) Justify the need for data preparation and cleaning in analytics projects. (CO1, K5) 6

(3.2) Design a complete data analytics lifecycle for a given business scenario. (CO1, K6) 6

Answer any one of the following:-

(3.3)	Discuss the role of SciPy in scientific computing with suitable examples. (CO2, K2)	6
(3.4)	Evaluate different data merging techniques and justify the best approach for large datasets. (CO2, K5)	6

Answer any one of the following:-

(3.5)	Write a Python program to retrieve all records from an SQLite table and display them. (CO3, K3)	6
(3.6)	Explain error handling in Python database operations using try-except with an example. (CO3, K2)	6

Answer any one of the following:-

(3.7)	Explain the concept and working of Advanced RNNs such as LSTM and GRU. (CO4, K3)	6
(3.8)	Critically analyze the impact of word vectors in natural language processing tasks. (CO4, K5)	6

Answer any one of the following:-

(3.9)	Discuss the roles of generator and discriminator in GAN with examples. (CO5, K2)	6
(3.10)	Differentiate between GANs and VAEs based on architecture and application. (CO5, K4)	6

SECTION-C 50

4. Answer any one of the following:-

(4.1)	Examine the role of Big Data platforms in managing scalability and performance. (CO1, K4)	10
(4.2)	Analyze the importance of operationalization in the data analytics lifecycle. (CO1, K4)	10

5. Answer any one of the following:-

(5.1)	Examine different techniques for handling missing and inconsistent data. (CO2, K4)	10
(5.2)	Assess the importance of data normalization in machine learning workflows. (CO2, K5)	10

6. Answer any one of the following:-

(6.1)	Apply SQL queries to perform CRUD operations on an SQLite database with a Python program. (CO3, K3)	10
(6.2)	Examine different types of errors in database operations and how Python handles them. (CO3, K4)	10

7. Answer any one of the following:-

(7.1)	Illustrate the process of text preprocessing and sequence modeling using TensorFlow. (CO4, K3)	10
(7.2)	Evaluate the effectiveness of TensorBoard visualization in model optimization. (CO4, K5)	10

8. Answer any one of the following:-

(8.1)	Explain the concept of autoencoders and their applications in data compression and feature learning. (CO5, K2)	10
(8.2)	Explain cross-domain GANs and their role in domain adaptation. (CO5, K2)	10