

GURU JAMBHESWAR UNIVERSITY OF SCIENCE AND TECHNOLOGY, HISAR

Centre for distance and online education Programme: Diploma in Data Science

Nomenclature: **Database Management System**

Code: DDS-21-T

Credits: 3+0+0

Semester: 2nd

Total Marks: 30

Important Instructions:

- 1) Attempt all Questions each assignment given below
- 2) Each assignment carries 15 marks
- 3) All questions are to be attempted in legible handwriting on plane white A-4 size paper and upload the scanned copy of the assignments on student's portal

Assignment – I

Q1. Explain the use of traditional file systems over DBMS in modern applications. Propose a hybrid architecture highlighting trade-offs in scalability, performance, and data integrity.

Q2. Describe the three-level DBMS architecture and its relevance in modern distributed systems.

Q3. Describe relationships, roles, and structural constraints in an E-R model. How are these represented effectively using E-R diagrams?

Assignment - II

Q1. Explain the concept of normalization and database anomalies in relational database design. How do candidate keys and super keys help in reducing redundancy?

Q2. Define functional dependencies and integrity constraints in a relational model. How do they influence the process of database decomposition?

Q3. Explain the concept of database transactions and different transaction states. How do ACID properties ensure reliability in transaction processing?

GURU JAMBHESWAR UNIVERSITY OF SCIENCE AND TECHNOLOGY, HISAR

Centre for distance and online education Programme: Diploma in Data Science

Nomenclature: **Artificial Intelligence**

Code: DDS-22-T

Credits: 3+0+0

Semester: 2nd

Total Marks: 30

Important Instructions:

- 1) Attempt all Questions each assignment given below
- 2) Each assignment carries 15 marks
- 3) All questions are to be attempted in legible handwriting on plane white A-4 size paper and upload the scanned copy of the assignments on student's portal

Assignment – I

Q1. Define Artificial Intelligence and explain its importance in modern computing. How does the Turing Test relate to measuring machine intelligence?

Q2. Compare Depth First Search and Breadth First Search techniques. In which situations is each search strategy more efficient?

Q3. Explain heuristic search techniques such as Generate and Test, Hill Climbing, and A* algorithm. How does AO* algorithm help in searching AND/OR graphs?

Assignment - II

Q1. Explain the concepts of propositional logic and predicate logic along with their syntax. How are facts represented and converted into normal and clause form in logic?

Q2. Discuss the significance of knowledge representation in AI. How do semantic networks and frames differ in representing knowledge structures?

Q3. Explain fuzzy logic systems and probabilistic reasoning. How does Bayes' theorem support decision making in uncertain environments?

GURU JAMBHESWAR UNIVERSITY OF SCIENCE AND TECHNOLOGY, HISAR

Centre for distance and online education Programme: Diploma in Data Science

Nomenclature: **Machine Learning**

Code: DDS-23-T

Credits: 3+0+0

Semester: 2nd

Total Marks: 30

Important Instructions:

- 1) Attempt all Questions each assignment given below
- 2) Each assignment carries 15 marks
- 3) All questions are to be attempted in legible handwriting on plane white A-4 size paper and upload the scanned copy of the assignments on student's portal

Assignment – I

Q1. Discuss various machine learning activities such as data collection, data cleaning, feature engineering, model training, evaluation, and deployment. Provide a complete workflow.

Q2. Explain Principal Component Analysis (PCA) and Linear Discriminant Analysis (LDA) in detail. Compare PCA and LDA based on working, purpose, and applications.

Q3. Describe different feature selection techniques, including filter, wrapper, and embedded methods. Explain their advantages and disadvantages.

Assignment - II

Q1. Describe the working of the k-Nearest Neighbor (k-NN) algorithm. Explain distance metrics, hyperparameter tuning, and bias-variance handling.

Q2. Provide a detailed explanation of Support Vector Machines (SVM). Explain hyperplanes, margins, kernel tricks, and applications

Q3. Explain hierarchical clustering. Compare agglomerative and divisive approaches with dendrogram explanation

GURU JAMBHESWAR UNIVERSITY OF SCIENCE AND TECHNOLOGY, HISAR

Centre for distance and online education Programme: Diploma in Data Science

Nomenclature: **Python Programming**

Code: DDS-24-T

Credits: 3+0+0

Semester: 2nd

Total Marks: 30

Important Instructions:

- 1) Attempt all Questions each assignment given below
- 2) Each assignment carries 15 marks
- 3) All questions are to be attempted in legible handwriting on plane white A-4 size paper and upload the scanned copy of the assignments on student's portal

Assignment – I

Q1. Explain Python functions. Describe user-defined functions, parameters (actual & formal), return values, and scope of variables with examples.

Q2. Describe modules in Python. Explain how to create, import, and use modules and packages with examples.

Q3. Explain file handling in Python. Write programs to read, write, and append data in files using different file functions.

Assignment - II

Q1 Explain Python functions including inbuilt and user-defined functions. How do parameter passing, default parameters, and recursion work in function design?

Q2 Describe modules and packages in Python. How can you create and import your own modules and what is the role of lambda functions?

Q3 Discuss Object-Oriented Programming concepts in Python such as classes, objects, inheritance, and polymorphism. How are exceptions handling mechanisms like try-except and user-defined exceptions implemented?

GURU JAMBHESWAR UNIVERSITY OF SCIENCE AND TECHNOLOGY, HISAR
Centre for distance and online education Programme: Diploma in Data Science

Nomenclature: **Data Analytics**

Semester: 2nd

Code: DDS-25-T

Total Marks: 30

Credits: 3+0+0

Important Instructions:

- 1) Attempt all Questions each assignment given below
- 2) Each assignment carries 15 marks
- 3) All questions are to be attempted in legible handwriting on plane white A-4 size paper and upload the scanned copy of the assignments on student's portal

Assignment – I

Q1. Describe the different types of Data Analytics: Descriptive, Diagnostic, Predictive, and Prescriptive. Compare them with suitable examples.

Q2. Discuss multiple linear regression. Explain how it differs from simple regression and describe its applications.

Q3. Describe cross-validation techniques. Explain k-fold cross-validation and its importance in model evaluation.

Assignment - II

Q1. Discuss stream computing and its importance in real-time data processing applications such as IoT and finance.

Q2. Explain exploratory data analysis (EDA). Describe visualization techniques used before analysis and how they help in understanding data.

Q3. Describe different data types and attributes in data analytics. Explain nominal, ordinal, interval, and ratio data with examples.