D–4023

Sub. Code
51811

DISTANCE EDUCATION

DIPLOMA IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING EXAMINATION, MAY 2024.

First Semester

FUNDAMENTALS OF ARTIFICIAL INTELLIGENCE

(CBCS 2021 Calendar Year Onwards)

Time : Three hours Maximum : 75 marks

SECTION A — ($10 \times 2 = 20$ marks)

Answer ALL questions.

1. Define Artificial Intelligence.

2. In AI problem characteristics 'Is the good solution absolute or relative'? With illustration justify the statement.

3. State the need for informed search algorithm.

4. 'In problem reduction the graph is known as AND-OR instead of AND'. Do you agree with the statement? Justify your answer.

5. What are the two levels involved in structuring the entities of knowledge representation?

6. State the frame problem in AI knowledge representation.

7. State two quantifiers and its representation.

8. What is control knowledge in AI?

9. What is learning in AI?

10. Define perceptron in neural network learning

SECTION B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Discuss about various problems solved by AI.

Or

(b) Explain characteristics of production system.

12. (a) Explain best first search algorithm and analyze its complexity.

Or

(b) Explain the general form of constraint satisfaction procedure with examples.

13. (a) Sketch and explain knowledge representation framework.

Or

(b) Write a note on approaches to knowledge representation.

14. (a) Write a note on computational functions and predicates.

Or

(b) Compare forward reasoning with backward reasoning.

15. (a) Write a note on rote learning.

Or

(b) Explain with illustration learning in problem solving.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Write a detailed note on defining problems as a state search space in AI.

17. Elaborate on the hill climbing heuristics search technique in AI.

18. With appropriate examples and diagram explain knowledge representation schemes in AI.

19. Explain in detail about representing knowledge using rules in AI.

20. Explain in detail about learning by discovery in AI.

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D–4024

Sub. Code
51812

DISTANCE EDUCATION

DIPLOMA IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING EXAMINATION, MAY 2024.

First Semester

RELATIONAL DATABASE MANAGEMENT SYSTEM (RDBMS)

(CBCS – 2021 Calendar Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL questions.

1. What is meant by Database Schema?
2. Define : DBMS.
3. What is an entity?
4. Give symbol and example of multivalued attribute in E-R diagram.
5. What is the use of Primary key?
6. Give a query to destroy a table.
7. Define : View.
8. What is meant by schema refinement?
9. How do you transform a database into an active one?
10. List any two problems of redundancy.

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Write a note on Data Abstraction.

Or

(b) Discuss the characteristics of Query Processor.

12. (a) List and explain the uses of notations in E-R diagrams.

Or

(b) Discuss the types of integrity constraints.

13. (a) Explain the operations on views.

Or

(b) Write a note on Triggers.

14. (a) Explain the concept of nested queries with example.

Or

(b) Discuss the concept of outer joins with examples.

15. (a) Discuss the uses of logical connectivity with example queries.

Or

(b) Write a note on the problems in decomposition.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain the characteristics and limitations of various data models in detail.

17. Elaborate on the concept of Database design using E-R diagrams.

18. Explain the various operations on Relational Algebra with examples.

19. Elaborate on types of relational calculus in detail.

20. Describe the various Normal Forms with example tables.

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D–4025

Sub. Code
51813

DISTANCE EDUCATION

DIPLOMA IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING EXAMINATION, MAY 2024.

First Semester

R PROGRAMMING

(CBCS – 2021 Calendar Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL questions.

1. What are the essentials of R Programming language?

2. What are expressions?

3. Define User defined functions.

4. List down the rules for defines a string

5. List the objects in R.

6. How to merge the list elements in R Programming?

7. What are Factors?

8. Define data reshaping.

9. Define Data Visualization.

10. What are the real-time applications of R?

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Write short notes on operators with suitable example.

Or

(b) Briefly explain the environment setup for the R Programming.

12. (a) Describe in brief about the decision making Statements with example.

Or

(b) Write Short notes on Functions in R.

13. (a) Elucidate the step for converting list to vector.

Or

(b) Describe in detail on accessing array elements with suitable example.

14. (a) List down the steps to join rows and columns in a data frame with example.

Or

(b) Elucidate the steps to extract data and merge data from data frame.

15. (a) Describe in brief about working with binary files in R Programming.

Or

(b) Write short notes on Data Visualization tools in R.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. The weights of five people before and after a diet programme are given in the table :

Before	78	72	78	79	105
After	67	65	79	70	93

Read the 'before' and 'after' values into two different vectors called before and after. Use R to evaluate the amount of weight lost for each participant. What is the average amount of weight lost?

17. Explain in detail on Control statements in R programming with suitable example.

18. Explain in detail, the vector elements in R programming.

19. Describe in detail with proper illustration, the matrix in R, accessing and manipulation.

20. Describe with neat sketch the Scatter plots tools in R Programming

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D–4026

Sub. Code
51821

DISTANCE EDUCATION

DIPLOMA IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING EXAMINATION, MAY 2024.

Second Semester

FUNDAMENTALS OF MACHINE LEARNING

(CBCS 2021 Calendar Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL questions.

1. Define : Data preprocessing.

2. What is hypothesis testing?

3. Why is validation important in machine learning?

4. What is tree pruning in machine learning?

5. Why do we use SVM for classification?

6. Define Rule based classification.

7. What are the different types of clustering in machine learning?

8. State the partition algorithm.

9. State the concept of Extreme Learning Machine.

10. What is Deep Belief Network?

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) What are the Key features of Machine Learning?

Or

(b) Differentiate Machine Learning with Artificial Intelligence.

12. (a) What are the various methods used in cross validation?

Or

(b) Explain parametric Machine Learning.

13. (a) Explain k-NN Algorithm for Machine Learning.

Or

(b) Explain Neural Network Classification for Machine Learning.

14. (a) Explain the concept of Cluster Analysis.

Or

(b) How Density based clustering work in Machine Learning?

15. (a) Explain the concept of Batch normalization.

Or

(b) Explain about Reinforcement Learning.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain the types and applications of Machine Learning.

17. Explain the statistical learning framework.

18. Describe hierarchical clustering in detail.

19. Give a brief note on various software tools used for Machine Learning.

20. What is Regularization in deep learning? Explain the various techniques used in it.

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D–4027

Sub. Code
51822

DISTANCE EDUCATION

DIPLOMA IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING EXAMINATION, MAY 2024.

Second Semester

PRINCIPLES OF SOFT COMPUTING

(CBCS 2021 Calendar Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL questions.

1. What are the features of hard computing?

2. State the learning process of Artificial Neural Network.

3. What do you mean by Boltzmann Machine?

4. State Kohonen self organizing network.

5. What do you mean by Hamming Network?

6. What are the four main operators in Genetic Algorithms?

7. Define Adaline network.

8. Which is defined by Membership function?

9. List out the four techniques used in Genetic Algorithms.

10. What are the encoding methods in Genetic Algorithm?

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Discuss the basic terminologies of ANN.

Or

(b) State the difference between unsupervised and supervised learning.

12. (a) Explain the operating principle of Adaptive Resonance Theory.

Or

(b) Describe the basic concept of Bidirectional Associate Memory.

13. (a) Explain the basic properties of fuzzy set.

Or

(b) Discuss the concept of Fuzzification.

14. (a) Explain the working methods of Fuzzy Inference.

Or

(b) Describe the basic concepts of Genetic Algorithm.

15. (a) Explain the different methods of Approximate Reasoning.

Or

(b) List out the applications of GA.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Describe the Radial Basis function of networks with diagrams.

17. Explain the Madaline Neural Network.

18. Discuss the concept of fuzzy logic control systems, advantages, disadvantages and applications.

19. Explain Fuzzy Decision Making with examples.

20. Discuss the classification of Genetic Algorithm.

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D–4028	Sub. Code
	51823

DISTANCE EDUCATION

DIPLOMA IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING EXAMINATION, MAY 2024.

Second Semester

PYTHON PROGRAMMING

(CBCS – 2021 Calendar Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL questions.

1. What is Python interpreter?

2. List the standard data types in Python.

3. Define Boolean Value.

4. Write the syntax and usage of for loop.

5. Mention the use of functions.

6. State Traversing string.

7. Is tuples comparison possible? Explain how with example.

8. Name the built-in functions that are used in Tuples.

9. Point out the concept of Indexing.

10. How does "del' operation work on dictionaries? Give an example.

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Explain the steps involved in program development cycle.

Or

(b) Explicate the data types in Python.

12. (a) What type of conditional structures are present in a programming language? How many of them are supported in Python? Explain each with example.

Or

(b) Illustrate Break and Continue statement with example.

13. (a) Differentiate UDF and Library functions.

Or

(b) Explain the concept of default arguments through example.

14. (a) How to creating and accessing the elements of a list? Explain.

Or

(b) Illuminate the following list functions.

(i) len( )

(ii) sum( )

(iii) any( )

(iv) all( )

(v) sorted( ).

15. (a) Discuss sorting. Mention its types.

Or

(b) Describe the different access modes of the files with an example.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explicate types of operators in python with appropriate example.

17. Answer the following questions.

    (a) What is String? How do you create a string in Python?

    (b) How to perform a user input in Python? Explain with example.

    (c) Write a program to check whether entered string is palindrome or not.

18. Briefly explain about function prototypes.

19. Give a comparison between lists, tuples and sets. Discuss.

20. Explain Python dictionaries in detail discussing its operations and methods.

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