DISTANCE EDUCATION

DIPLOMA IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING EXAMINATION, DECEMBER 2023.

First Semester

FUNDAMENTALS OF ARTIFICIAL INTELLIGENCE

(CBCS 2021 Calendar Year Onwards)

Time : Three hours   Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL questions.

1.   What is an AI technique with example?

2.   What do you meant by Problem space?

3.   Define Constraint satisfaction problem.

4.   What type of strategies are followed in Means-end-analysis?

5.   List out the main approaches of Knowledge Representation.

6.   What is Resolution? Why it is used in AI?

7.   Mention the relationship between instance and ISA.

8.   What do you mean by matching in AI?

9.   List out the characteristics of Rote Learning.

10.   What is Neural Net Learning in AI?

PART B — (5 × 5 = 25 marks)

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

11. (a) Explain about the Missionaries and Cannibals Problem.

Or

(b) Briefly discuss about the criteria for success factors in AI.

12. (a) Explain about generate and test search techniques.

Or

(b) Illustrate in detail about the Best-First Search algorithm.

13. (a) Discuss about knowledge representation and its types in AI.

Or

(b) Explain about the issues of knowledge representation.

14. (a) Write short notes on Mapping techniques in AI.

Or

(b) Discuss briefly about the Matching Techniques.

15. (a) Write short notes on learning and types of learning in AI.

Or

(b) Briefly explain about Analogy in AI.

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PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Evaluate a problem as a state space search with an example.

17. Explain about the features about Hill climbing.

18. Discuss about the difference between Forward and Backward Reasoning.

19. Elucidate the about the concept of explanation based learning.

20. Elaborate the role of Genetic Learning in AI.

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DISTANCE EDUCATION

DIPLOMA IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING EXAMINATION, DECEMBER 2023.

First Semester

RELATIONAL DATABASE MANAGEMENT SYSTEM
(RDBMS)

(CBCS 2021 Calendar Year Onwards)

Time : Three hours   Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL questions.

1.   Define Database.

2.   What are the purposes of Query Processor?

3.   What is meant by weak entity set? Give an example.

4.   How do we mention derived attribute in E-R diagram? Give symbol and example.

5.   What are the characteristics of a primary key?

6.   Give a query to increase the size of an existing attribute of a table.

7.   State any four relational algebraic notations.

8.   Define NULL values.

9.   What are the uses of Triggers in Database?

10. State any two problems of redundancy.

PART B — (5 × 5 = 25 marks)

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

11. (a) State any five differences of Database Systems and File Systems.

Or

(b) Discuss the characteristics of Transaction Management System.

12. (a) Explain the attributed related notations used in E-R diagrams.

Or

(b) What are the types of integrity constraints? Explain.

13. (a) Explain the concept of views and its usages.

Or

(b) Write a note on Expressive power of Relational Algebra.

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

Or

(b) Discuss the uses of aggregative operators with example queries.

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

Or

(b) Explain the differences between 3NF and BCNF.

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PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Elaborate on the various data models in detail.

17. Describe the concept of Database design and E-R diagrams.

18. Explain the concept of views and operations on views with example queries.

19. Illustrate the various operations on Relational Algebra with examples.

20. Describe the concept of various Normal Forms with example tables.

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DISTANCE EDUCATION

DIPLOMA IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING EXAMINATION, DECEMBER 2023.

First Semester

R PROGRAMMING

(CBCS 2021 Calendar Year Onwards)

Time : Three hours   Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. List down the features of R Programming.

2. What are the rules for assigning name to a variable?

3. Define functions.

4. Define Recursion.

5. List the advantages of Vectors for data manipulation.

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

7. What are Frames?

8. Define melting and casting.

9. What are Binary Files?

10. What are the Data Visualizations tools available in R Programming?

PART B — (5 × 5 = 25 marks)

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

11. (a) Write the procedure to find and delete a variable in R Programming.

Or

(b) Write Short notes on assignment operator with an example.

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

Or

(b) Write Short notes on String manipulation.

13. (a) Elucidate the steps to converting list to vector with an example.

Or

(b) Describe in detail about the vector creation and manipulation.

14. (a) Write short notes on accessing elements of a matrix with an example.

Or

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

15. (a) Describe in brief about working with CSV Files in R Programming.

Or

(b) Write short notes of MySQL connection in R Programming.

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PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Explain in detail about the operators with suitable example.

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

18. Explain in detail with proper illustration, the arrays and accessing elements in an array.

19. Describe in detail with proper illustration, the Data Frames.

20. Elucidate with proper example, the procedure for analyzing, reading and writing the binary files in R Programming.

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DISTANCE EDUCATION

Diploma in (Artificial intelligence and Machine Hearing)
EXAMINATION, DECEMBER 2023.

Second Semester

FUNDAMENTALS OF MACHINE LEARNING

(CBCS 2021 Calendar Year Onwards)

Time : Three hours   Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL questions.

1. Mention the difference between Data Mining and Machine learning.

2. State the reasons for overfitting.

3. What is meant by parametric method?

4. What is the difference between artificial learning and machine learning?

5. What is the job of 'Un Supervised Learning'?

6. What is classifier in machine learning?

7. What is Genetic Programming?

8. What are the two methods used for the calibration in Supervised Learning?

9. When to use ensemble learning?

10. What is deep learning?

PART B — (5 × 5 = 25 marks)

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

11. (a) Compare and contrast artificial intelligence, machine learning and deep learning.

Or

(b) What are the three most important components of every machine learning algorithm? Explain briefly.

12. (a) Why Machine was Learning Introduced? Narrate.

Or

(b) Explain briefly about ML model.

13. (a) Elucidate the meaning of 'Naive' in Naive Bayes.

Or

(b) What is PCA? How it is used?

14. (a) Write and explain SVM Algorithm.

Or

(b) What is Ensemble learning?

15. (a) Explain the Gradient Search to Maximize Likelihood in a neural Net.

Or

(b) Explain the Central Limit Theorem with an example.

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PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Explain in detail about approaches of ML algorithms.

17. What is Non-parametric method? Explain with example.

18. Explain in detail about k-NN Algorithm.

19. Explain in detail about clustering.

20. Explain in detail about RNN.

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DISTANCE EDUCATION

DIPLOMA IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING EXAMINATION, DECEMBER 2023.

Second Semester

PRINCIPLES OF SOFT COMPUTING

(CBCS 2021 Calendar Year Onwards)

Time : Three hours   Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL questions.

1. Compare hard computing and soft computing.

2. What is leaky learning?

3. What is back propagation NN?

4. Mention the application areas of Neural Network.

5. What are called unsupervised learning networks?

6. What is called self-organizing network?

7. Write down the operations on fuzzy sets.

8. What do you mean by fuzzy equivalence and tolerance relation?

9. What is called approximate reasoning?

10. Write down the elements of GA.

PART B — (5 × 5 = 25 marks)

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

11. (a) Appraise the evolution of soft computing.

Or

(b) Distinguish between artificial neuron and biological neuron.

12. (a) Difference between feed forward, feedback and recurrent neural network.

Or

(b) Explain the working of associative memory networks.

13. (a) Discuss the applications of Kohonen self-organizing network.

Or

(b) Give the characteristics of counter propagation network.

14. (a) Explain the properties of fuzzy sets.

Or

(b) Discuss the methods of Defuzzification.

15. (a) Write down the procedure for formation and decomposition of fuzzy rules.

Or

(b) Differentiate Traditional Vs Genetic Algorithm.

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PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Describe the architecture of Neural Network.

17. Explain radial basis function neural network with neat sketch.

18. Explain the working principles of ART network.

19. Explain the following :

   (a) Fuzzy propositions

   (b) Aggregation of fuzzy sets.

20. Mention the role of fitness function in GA and also explain the crossover operation in GA.

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DISTANCE EDUCATION

DIPLOMA IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING EXAMINATION, DECEMBER 2023.

Second Semester

PYTHON PROGRAMMING

(CBCS 2021 Calendar Year Onwards)

Time : Three hours　　　　　　　Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer ALL questions.

1. Write any five reserved keywords in Python.

2. Write a Python code segment to get the name of the user and print it.

3. Write a Python code segment to print even numbers from 1 to 10 using while loop.

4. Predict the output of following code :

   For i in range (10, –1, –2) ;

   Print(i)

5. What are the rules to define a function in Python?

6. List out any four string formatting operators.

7. How to slice a list in Python?

8. Write a Python code segment to sort a tuple.

9. Give a function that can take a value and return the first key mapping to that value in a dictionary.

10. What is the purpose of Numpy library?

PART B — (5 × 5 = 25 marks)

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

11. (a) Discuss the features of Python.

Or

(b) Write short notes on the following functions :

(i) input( )

(ii) eval( )

12. (a) Explain nested loops, break and continue statements giving examples.

Or

(b) Discuss the various methods to remove items from a dictionary.

13. (a) Give a brief account on function definition and call. Give examples.

Or

(b) Explain the various on strings in Python.

14. (a) Discuss the various ways to delete the elements from a list.

Or

(b) How to create tuple and access its values? Explain.

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15. (a) Write short notes on data visualization using Matplotlib.

Or

(b) How to manipulate the data with pandas? Explain.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Discuss the various operators in Python with suitable examples.

17. Explain if-else and nested if statements with suitable examples.

18. Explain in detail about built-in tuple functions in Python.

19. Explain in detail about the following :
    (a) Remove items in a set
    (b) Set classes.

20. Explain different modes of opening a file.

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