D–7037	Sub. Code
	51811

DISTANCE EDUCATION

DIPLOMA IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING EXAMINATION, DECEMBER 2022.

First Semester

FUNDAMENTALS OF ARTIFICIAL INTELLIGENCE

(CBCS 2021 Calendar Year Onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer ALL questions.

1. List out AI languages.
2. How do we define a problem in AI?
3. What are called Heuristic search techniques?
4. Mention the merits of problem reduction technique.
5. What is the need for mapping in knowledge representation?
6. Write down the various issues in knowledge representation.
7. What is predicate logic?
8. What is called control knowledge?
9. What are the various methods of learning?
10. What is meant by rote learning?

PART B — ($5 \times 5 = 25$ marks)

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

11. (a) Discuss briefly about problems, problem spaces and search.

Or

(b) List down the application areas of AI.

12. (a) Explain Hill climbing algorithm with example.

Or

(b) What is means end analysis? Explain.

13. (a) Explain the various approaches in knowledge representation.

Or

(b) Discuss about frame problem.

14. (a) Compare Procedural vs Declarative knowledge.

Or

(b) How resolution is carried out in predicates? Explain.

15. (a) Write short notes on: Learning by taking advice.

Or

(b) Discuss about Explanation based learning.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain AI problems and AI techniques.

17. Describe Best first search algorithm.

18. What is knowledge representation? How it is achieved in AI?

19. Describe the rules in predicate and propositional logic.

20. Discuss the various methods of AI learning.

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D–8446

Sub. Code
51812

DISTANCE EDUCATION
DIPLOMA IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING
EXAMINATION, DEC 2022.

RELATIONAL DATABASE MANAGEMENT SYSTEM (RDBMS)

(CBCS 2021 - CALENDAR YEAR ONWARDS)

Time: 3 hours Maximum: 75 marks

SECTION A — (10 × 2 = 20 Marks)

Answer all questions.

1. What do you mean by data model?
2. What are the three components of query processor?
3. Define entity?
4. What is a derived attribute?
5. What is the use of Drop command?
6. What are the steps in logical database design?
7. List out the fundamental Relational Algebra Operations?
8. Define the term tuple?
9. What is Nested query in SQL?
10. Expand BCNF? Why is BCNF better than 3NF?

SECTION B — (5× 5 = 25 Marks)

Answer all questions, Choosing either (a) or (b)

11.(a) Explain about the Applications of Database?

(or)

(b) Briefly discuss about the Language DDL with examples?

12.(a) Explain about the notations of E-R diagrams?

(or)

(b) Illustrate in detail about the conceptual design for large enterprises?

13. (a) Discuss about the types of Integrity constraints?

(or)

(b) Explain about the usage of ALTER command in tables?

14.(a) Write short notes on Domain relational calculus.

(or)

(b) Differentiate Relational Algebra and Relational Calculus?

15.(a) Write short notes on the basic structure of SQL Query?

(or)

(b) Briefly Explain about Aggregate functions with examples?

SECTION C — (3 × 10 = 30 Marks)

Answer any three questions

16. Discuss about various types of Database users in DBMS?

17. Enumerate about the Database design and its types? Why it is Important?

18. Discuss in detail about Database views and its types, advantages?

19. Elucidate about Joins with examples?

20. Elaborate about the Normal Forms with examples?

D–8447

Sub. Code
51813

DISTANCE EDUCATION

DIPLOMA IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

EXAMINATION, DEC 2022.

R PROGRAMMING

(CBCS 2021 - CALENDAR YEAR ONWARDS)

Time : 3 hours Maximum : 75 Marks

SECTION A — (10× 2 = 20 Marks)

Answer all questions.

1. List out the rules to define a variable.
2. How will you search a variable in a Dataset in R?
3. What are the control statements in R?
4. How do you view String elements in R?
5. Define vector and what are the common properties of vector.
6. List out the available R Packages.
7. How to create a Factor in R?
8. What is CSV file in R?
9. Which function is used to read a csv file in R?
10. Define Histogram in R programming?

SECTION B — (5× 5 = 25 Marks)

Answer all questions, Choosing either (a) or (b)

11.(a) Write a short note on operators in R programming.

(or)

(b) What ate the different data types in R programming explain with examples.

12.(a) List down any few string functions.

(or)

(b) What is the purpose of break and continue?

13. (a) How to create and manipulate variables and vector in R.

(or)

(b) How to convert list to vector?

14.(a) How to access elements of matrix R programming?

(or)

(b) Write a short note on data reshaping.

15.(a) How to read and write binary files?

(or)

(b) Write about Graph plotting in R programming and its types?

SECTION C — (3 × 10 = 30 Marks)

Answer any three questions

16 Discuss on the features of R programming?

17. Write a program to add two numbers using functions with parameters.

18. Describe about list with syntax with your own example.

19. Explain about melting and casting operations in R programming.

20. Elaborate on table manipulation in R with examples.

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D–7040	Sub. Code
	51821

DISTANCE EDUCATION

DIPLOMA IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING EXAMINATION, DECEMBER 2022.

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.

All questions carry equal marks.

1. Define Machine learning.
2. What is data pre-processing?
3. State about training.
4. Define validation.
5. What is supervised learning?
6. Comment on SVM.
7. What is cluster analysis?
8. Define ELM.
9. List out the uses of Matlab.
10. Define batch normalization.

PART B — ($5 \times 5 = 25$ marks)

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

All questions carry equal marks.

11. (a) List out the AI features.

Or

(b) Explain about labels.

12. (a) Compare parametric and non-parametric methods.

Or

(b) Discuss about the approaches for classification.

13. (a) Describe about classification by back propagation algorithm.

Or

(b) Write about K-Nearest Neighbour algorithm.

14. (a) Explain about the Distance measures.

Or

(b) Discuss about the types of clustering.

15. (a) Explain about Deep Belief networks.

Or

(b) Describe about the time series forecasting.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

All questions carry equal marks.

16. Compare machine learning and AI.

17. Illustrate the statistical learning framework.

18. Elucidate the Neural Network classification.

19. Discuss about the partition algorithms of clustering.

20. Explain the following software tools :

    (a) Rapid-miner

    (b) Tensor flow.

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D–7041

Sub. Code
51822

DISTANCE EDUCATION

DIPLOMA IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING EXAMINATION, DECEMBER 2022.

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. Outline the differences between hard computing and soft computing.

2. What is associative memory?

3. Write the algorithm for Adaline network training?

4. Why BAM is required in network model?

5. What is feature mapping?

6. What are the two stages involved in the training process of a CPN?

7. Define fuzzy sets.

8. What do you mean by Fuzzy Logic Controller?

9. What are Genetic Algorithms?

10. What are the operators used in Genetic Algorithm?

PART B — (5 × 5 = 25 marks)

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

11. (a) Explain applications of artificial neural networks.

Or

(b) Explain learning rules.

12. (a) Draw and explain multilayer perceptron model.

Or

(b) Draw and explain training algorithm for Hopfield network.

13. (a) Explain the working of Adaptive Resonance Theory.

Or

(b) Compare between the properties of fuzzy sets with classical sets.

14. (a) What is membership function? Enlist and explain its features.

Or

(b) Sketch the block diagram of fuzzy logic controller for a non-linear process.

15. (a) Compare and contrast traditional algorithm and genetic algorithm.

Or

(b) Briefly explain on the applications of GA.

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Explain with neat diagram supervised and unsupervised learning in NN.

17. Enumerate all the sixteen steps with Equations for implementing a Back Propagation algorithm.

18. Elucidate on the Architecture of Full Counter propagation Network.

19. Explain in detail how fuzzy logic can be used in Automobile industry.

20. A genetic algorithm is to be used to evolve a binary string of length n containing only 1s. The initial population is a randomly generated set of binary strings of length *n*. Give a suitable fitness function for this problem.

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D–7042	Sub. Code
	51823

DISTANCE EDUCATION

DIPLOMA IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING EXAMINATION, DECEMBER 2022.

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. Why use Python?
2. What is Python Character Set?
3. Define range() function.
4. Comment on Boolean Operator.
5. List out the uses of a function.
6. What is str class?
7. How to create a list?
8. Define tuple() function.
9. Why need dictionary in python?
10. Comment on seek() function.

PART B — (5 × 5 = 25 marks)

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

11. (a) How to executing python programs? Explain.

Or

(b) Write a python program to calculate the area of a rectangle.

12. (a) Explain about multiway if-elif-else statements with example.

Or

(b) Write a short note on break and continue statements.

13. (a) Explain about parameters and arguments in a function.

Or

(b) Illustrate on String operators.

14. (a) Explain about In-built List functions with example.

Or

(b) Briefly explain about indexing and slicing tuples.

15. (a) Write a note on Formatting Dictionaries.

Or

(b) Why need of file handling in python?

PART C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Explain various types of operators in Python.

17. Compare While loop and for loop with example program.

18. Discuss about Local and Global scope of a variable.

19. Explain various methods of List along with example.

20. Discuss about Text input using file. Explain with example program.

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