D–1036	Sub. Code
	51811

DISTANCE EDUCATION

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

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 the term Artificial Intelligence?

2. List out the application areas of AI.

3. Define production systems in AI?

4. What is Reduction in Problem solving?

5. Mention the characteristics of a problem in AI?

6. What do you mean by Frame problem in AI?

7. Where is Predicate Logic used in Artificial Intelligence?

8. What is Quantifier and its types?

9. Define. Induction based learning.

10. What are the principle of Discovery learning?

SECTION B — (5 × 5 = 25 marks)

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

11. (a) Explain the challenges of AI and how to solve them.

Or

(b) Briefly Discuss about the Application areas in AI?

12. (a) Explain about the Means-End Analysis procedure with example.

Or

(b) Illustrate in detail about the constraint satisfaction problems with example?

13. (a) Discuss about logic programming and its features?

Or

(b) Explain about the computable functions and predicates.

14. (a) Write short notes on Resolution method in AI.

Or

(b) Discuss Briefly about Forward Versus Backward Reasoning.

15. (a) Write short notes on Rote Learning.

Or

(b) Briefly Explain about Formal Learning Theory.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions

16. Discuss about the Production System components and Characteristics in AI?

17. Elaborate in detail about various Heuristic Search techniques?

18. Discuss about the various techniques of Knowledge Representation in AI?

19. Elucidate the differences between Procedural and Declarative Knowledge?

20. Elaborate the role of Neural Net Learning in AI?

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	51812

DISTANCE EDUCATION

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

First Semester

RELATIONAL DATABASE MANAGEMENT SYSTEM (RDBMS)

(CBCS 2021 Calendar Year Onwards)

Time : Three hours Maximum : 75 marks

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

Answer ALL questions

1. What do you mean by data model?

2. What is the Data Dictionary?

3. Difference between Schema and Instance.

4. What is an attribute?

5. Give the syntax of creating a table with example?

6. Can we alter table in View? Give Example.

7. What is the use of rename operation?

8. What does Division mean in Relational Algebra?

9. Write about Correlated Nested Query?

10. Define Schema refinement?

SECTION B — (5 × 5 = 25 marks)

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

11. (a) Explain about the role of a DBA?

Or

(b) Briefly Discuss about the DML with examples?

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

Or

(b) Illustrate in detail about Entity, Entity, Set and Entity type?

13. (a) Discuss about enforcing integrity constraints?

Or

(b) Write in detail about views and its types?

14. (a) Write short notes on relational algebra operations.

Or

(b) Discuss Briefly about Tuple relational calculus?

15. (a) Write short notes on the comparison operators?

Or

(b) Briefly Explain about First Normal Form?

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions

16. Differentiate Database system with File system.

17. Enumerate about the concept design with the ER model.

18. Discuss in detail about Querying relational data.

19. Elucidate about different types of Joins with Examples.

20. Elaborate about Decomposition and its types with diagrams.

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	51813

DISTANCE EDUCATION

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

First Semester

R PROGRAMMING

(CBCS-2021 Calendar Year Onwards)

Time : Three hours Maximum : 75 marks

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

Answer ALL questions.

1. What is R programming used for?

2. Difference between console and script in R programming.

3. List out the function components of R programming.

4. What type functions are used in R programming.

5. What do you mean vector?

6. How do you access an array element in R programming?

7. Why are data frames important in R programming?

8. What is melting and casting?

9. How do you load CSV file in R programming

10. How will you describe a scatter plot in R programming.

SECTION B — (5 × 5 = 25 marks)

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

11. (a) Define operator. List out the types of operators.

Or

(b) Write a note on variables. How will you assign and delete variables?

12. (a) Write a program to do the basic arithmetic calculations using functions and parameters.

Or

(b) How recursion helps the programmer?

13. (a) Write a short note on list with syntax and example.

Or

(b) Discuss shortly on manipulating array elements.

14. (a) How to load package to library in R?

Or

(b) Write about data reshaping.

15. (a) How to read and write XML files in R?

Or

(b) Write detailed note on table manipulation with example.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Discuss the essentials of the R programming?

17. Write a detailed note on String manipulation.

18. Illustrate array with an example.

19. Discuss the basic operations of matrix, Explain any two of them.

20. Discuss on different type of charts. Explain any three of them with examples.

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D–1039

Sub. Code
51821

DISTANCE EDUCATION

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

Second Semester

FUNDAMENTALS OF MACHINE LEARNING

(CBCS 2021 Calendar Year Onwards)

Time : Three hours Maximum : 75 marks

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

Answer ALL questions

1. Define the term Machine Learning.

2. What are the real world problems that can be solved by Machine Learning?

3. Differentiate training and test dataset.

4. Define the term Tree Pruning.

5. What are the characteristics of Rule based classification?

6. List out the types of clustering in Machine Learning.

7. What are the advantages of density – based clustering over K means?

8. What is the commonly used distance measure in Machine Learning?

9. Compare Deep learning with Machine Learning.

10. What are Auto – encoders in Machine Learning?

SECTION B — ($5 \times 5 = 25$ marks)

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

11. (a) Discuss the applications of Machine Learning.

Or

(b) Explain the various stages of Data Preprocessing.

12. (a) State the differences between Parametric and Non – parametric methods.

Or

(b) Explain Decision Tree classification algorithm with diagram.

13. (a) Describe the working principle, advantages and disadvantages of Random Forest Algorithm.

Or

(b) Explain Hierarchical clustering Algorithms and its types.

14. (a) Explain the general concept of Unsupervised learning.

Or

(b) Describe the applications of Reinforcement Learning.

15. (a) Discuss the basics of Convolutional Neural Networks.

Or

(b) Describe the methodologies of time series forecasting.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions

16. Describe the Hypothesies test in Machine Learning.

17. Explain the statistical learning framework.

18. Describe the Support Vector Machines with suitable examples.

19. State and explain Markov Decision Process.

20. Explain the architecture, functions and applications of Deep Belief Networks.

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	51822

DISTANCE EDUCATION

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

Second Semester

PRINCIPLES OF SOFT COMPUTING

(CBCS 2021 Calendar Year Onwards)

Time : Three hours Maximum : 75 marks

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

Answer ALL questions.

1. Define soft computing?

2. Name the characteristics of soft computing.

3. What are the types of Boltzmann machine in soft computing?

4. Define Bidirectional Associate Memory.

5. What are the different types of Decision making in soft computing.

6. What do you mean by Fuzzy composition in soft computing.

7. Define Adaline network.

8. What is Fuzzy Arithmetic?

9. List out the phases involved in genetic algorithm.

10. State the limitations of Genetic Algorithm.

SECTION B — (5 × 5 = 25 marks)

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

11. (a) Write the differences of soft computing and hard computing.

Or

(b) Explain the fundamental concepts of Artificial Neural Network.

12. (a) Explain the types of Back Propagation.

Or

(b) Explain counter propagation with examples.

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

Or

(b) Describe the properties of Fuzzy Set.

14. (a) Explain the defuzzification with example.

Or

(b) Describe the concept of Expert systems.

15. (a) Explain the Elements of GA.

Or

(b) List out the applications of GA.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions

16. Explain the constituents of soft computing.

17. Describe the usage of Hopfield Network.

18. What is Crisp set and Fuzzy set? Distinguish between them.

19. Write about the Fuzzy Propositions.

20. Explain fitness function in Genetic Algorithm.

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	51823

DISTANCE EDUCATION

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

Second Semester

PYTHON PROGRAMMING

(CBCS 2021 Calendar Year Onwards)

Time : Three hours Maximum : 75 marks

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

Answer ALL questions.

1. Write in one line of following terms - selection, iteration.

2. Give the features of Python.

3. What is chained conditional statement?

4. Define range() Function and how it is used in lists?

5. Point out the use of 'str' class.

6. How do you print the index of an array in Python?

7. Differentiate tuples and lists in Python.

8. Delineate Slicing.

9. State Python's dictionaries.

10. Why do we need File Handling?

SECTION B — (5 × 5 = 25 marks)

Answer All questions choosing either (a) or (b).

11. (a) Explain about the following programming language with example.

(i) Machine language

(ii) Assembly language

(iii) High level language.

Or

(b) What are types of expressions in Python? Explain.

12. (a) Discuss nested 'if' statement with suitable example.

Or

(b) Illuminate Multi-way 'if-elif' statements with example.

13. (a) Demonstrate how a Function calls another function? Justify your answer.

Or

(b) Enlighten call by value and call by reference in Python.

14. (a) Write a Python program to perform linear search on a list.

Or

(b) Elaborate the following List methods with an example

(i) append () (ii) extend ()

(iii) insert () (iv) index ()

(v) sort ()

15. (a) What is tuple assignment? Explain it with an example.

Or

(b) Discuss the following methods associated with the file object:

(i) read () (ii) readline ()

(iii) readlines () (iv) tell ()

(v) seek ()

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Describe briefly constant, variables, expression. keywords and statements available in Python.

17. Explicate the purpose of loop structure in a programming language. Describe the syntax and semantics of any two loop structures provided by Python.

18. Discuss in detail about:

(a) local and Global Variables

(b) return statement

(c) immutable Strings

19. (a) Explain List parameters with an example.

(b) Demonstrate with code the various operations that can be performed on tuples.

20. Illuminate in detail about Python Files, its types, functions and operations that can be performed on files with examples.