D–1034

Sub. Code
51811

DISTANCE EDUCATION

DIPLOMA IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING EXAMINATION, DECEMBER 2021.

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. Define the term AI.

2. What do you mean by Reflex agent?

3. Write the goal of Breadth first search.

4. What is meant by cutting of search?

5. What is Declarative knowledge?

6. Name the various approaches to knowledge representation.

7. What is First order logic?

8. State the use of Backward chaining.

9. What are the elements of learning agent?

10. What is meant by genetic learning?

PART B — ($5 \times 5 = 25$ marks)

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

11. (a) Write short notes on AI problems.

Or

(b) Explain water jug problem in AI.

12. (a) Briefly describe Breadth first search Algorithm.

Or

(b) Describe minimax search procedure.

13. (a) Discuss the issues in Knowledge representation.

Or

(b) Explain briefly on Propositional Logic with its Truth Table.

14. (a) Write down the rules of First order Inference.

Or

(b) Compare and contrast Forward vs Backward reasoning.

15. (a) Write about rote learning.

Or

(b) Explain inductive learning.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Describe problem characteristics and production system characteristics in AI.

17. Explain Constraint satisfaction problem with an example.

18. Describe the various ways of Knowledge Representation.

19. Explain computable functions and predicates.

20. Discuss about Neural net learning.

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	51812

DISTANCE EDUCATION

DIPLOMA IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING EXAMINATION, DECEMBER 2021.

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. Define the term Schema.

2. What is DML?

3. What are called attributes?

4. Mention the features of ER model.

5. What is the purpose of Integrity constraint?

6. What is a view in Database?

7. Write down the selection operation in Relational algebra.

8. What is SQL query?

9. What do you mean by trigger?

10. What is Normalization?

PART B — ($5 \times 5 = 25$ marks)

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

11. (a) Explain relational model with neat sketch.

Or

(b) Write about Data Definition Language.

12. (a) Explain logical data base design of entity sets and relationship sets.

Or

(b) Explain components of ER model.

13. (a) Explain the various Integrity constraints with suitable examples.

Or

(b) How will you create and alter a view in a Database? Explain.

14. (a) Explain SQL queries with examples.

Or

(b) Write about Domain relational calculus.

15. (a) What is called outer join? Explain with an example.

Or

(b) Explain BCNF with suitable example.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Describe the Database Management system architecture with neat sketch.

17. Describe the ER model with an example.

18. Discuss the elements of Relational model.

19. Discuss the applications of Relational algebra in DBMS.

20. Explain the following:

    (a) Correlated subquery

    (b) Aggregative operators.

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DISTANCE EDUCATION

DIPLOMA IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING EXAMINATION, DECEMBER 2021.

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. Write down the comment statement in R language.

2. Mention the data types in R.

3. Write down the syntax of repeat while statement in R.

4. Write any two string handling functions in R.

5. Differentiate between Vector and Lists.

6. How will you create an one dimensional array in R?

7. What is called Frame?

8. How will you add package to a library?

9. How to read CSV files in R?

10. Write down the command to plot Line graph in R environment.

PART B — ($5 \times 5 = 25$ marks)

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

11. (a) Discuss the features of R programming.

Or

(b) Write about Arithmetic operators in R with syntax and example.

12. (a) Explain Decision making statements in R with a sample code.

Or

(b) How will you create strings in R? Explain with syntax and example.

13. (a) Discuss about Vector creation and Vector manipulation in R.

Or

(b) Explain the array manipulation in R with syntax and example.

14. (a) Write down the steps in creating Factors in R.

Or

(b) Write short notes on melting and casting.

15. (a) How to install, load and read excel files in R? Explain.

Or

(b) Discuss the steps in creating a scatterplot in R.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Discuss about R script file.

17. Write a R program to implement Recursion.

18. Describe the steps in creating, accessing, manipulating and merging Lists.

19. Discuss about packages in R.

20. Write a R script to input and read XML files.

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DISTANCE EDUCATION

DIPLOMA IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING EXAMINATION, DECEMBER 2021.

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. What is Machine learning?

2. What is 'Overfitting' in Machine learning?

3. Write the meaning of 'Training set' and 'Test set'.

4. List down various approaches for machine learning.

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

6. What is algorithm independent machine learning?

7. What is ensemble learning?

8. What is clustering?

9. What does the word feedforward mean in feedforward artificial neural network?

10. What is gradient checking?

PART B — ($5 \times 5 = 25$ marks)

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

11. (a) Briefly explain the types of learning.

Or

(b) What is independent component analysis? Explain.

12. (a) Give a brief account on different types of Learning/Training models in ML.

Or

(b) How do you select important variables while working on a data set? Explain.

13. (a) Bring out the issues in decision tree induction.

Or

(b) What are the requirements of clustering algorithms?

14. (a) Explain the differences between Random Forest and Gradient Boosting machines.

Or

(b) Compare and contrast Supervised, Unsupervised and Reinforcement Learning.

15. (a) Explain the idea behind EM Algorithm.

Or

(b) What is conditional Independence? Explain.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain in detail about data preprocessing.

17. What are the basic design issues and approaches to machine learning?

18. Write and explain Random Forest algorithm.

19. Describe K-nearest Neighbour learning Algorithm for continuous valued target function.

20. Explain in detail about CNN.

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	51822

DISTANCE EDUCATION

DIPLOMA IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING EXAMINATION, DECEMBER 2021.

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 is soft computing?

2. Mention the application areas of ANN.

3. Define machine learning.

4. List the learning methods used in propagation network.

5. What is counter propagation network?

6. How degree of similarity is controlled in ART network?

7. Compare crisp and fuzzy sets.

8. What do you mean by Defuzzification?

9. What is fuzzy inference system?

10. State the operators of Genetic algorithm.

PART B — ($5 \times 5 = 25$ marks)

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

11. (a) Outline the differences between hard computing and soft computing.

Or

(b) Explain the working of Artificial neuron.

12. (a) Write short notes on perceptron network.

Or

(b) Describe the steps of back propagation algorithm.

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

Or

(b) Explain how the clusters are formed in an ART network.

14. (a) Explain fuzzy compliment and fuzzy relation.

Or

(b) What are the features involved in characterizing membership function? Sketch it.

15. (a) Explain the framework for fuzzy expert system with a diagram.

Or

(b) Discuss the applications of Genetic Algorithm.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain the various types of activation functions used in neural network with the aid of mathematical and graphical representation.

17. Describe the working of Adaline and Madaline networks.

18. Describe the counter propagation learning network algorithm with a neat sketch.

19. Illustrate the different types of defuzzification methods with relevant mathematical expression and diagram.

20. Explain the genetic operators and fitness functions in respect of evolutionary computing.

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DISTANCE EDUCATION

DIPLOMA IN ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING EXAMINATION, DECEMBER 2021.

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. What do mean by the terms statement expression in Python?

2. What is variable? How to assign value to a variable?

3. Write the purpose of range() function.

4. What is the job of break and continue statements?

5. What are the advantages of using functions?

6. What will be the output of the given code?
```
string= “welcome”
Letter = string[5]
Print(Letter)
```

7. List out the main differences between lists and tuples.

8. How to create a list in python? Illustrate the use of negative indexing of list through example.

9. Write a Python program to add a new item to dictionary.

10. Define the term set. Write code segment to access items in sets.

PART B — ($5 \times 5 = 25$ marks)

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

11. (a) Explain relational and logical operators in Python.

Or

(b) Write short notes on the following:

(i) Comments

(ii) Character set

12. (a) Write a Python program to print the prime numbers between two numbers input by the user.

Or

(b) Discuss on seek() function.

13. (a) Explain about local and global variables. Give suitable examples.

Or

(b) How to declare and call functions in Python programs? Illustrate with an example script.

14. (a) What are the two ways to make copy of a list? Explain with examples.

Or

(b) Discuss various built-in list methods available in Python.

15. (a) Write short notes on the following:

(i) Nested dictionaries

(ii) Traversing dictionaries.

Or

(b) Explain the built-in methods available in sets.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain in detail about data types in Python.

17. Describe control statements with suitable example.

18. What are the string handling functions available in Python? Explain with an example.

19. With examples, explain the following:

(a) List operators

(b) Passing list to a function.

20. Demonstrate with code the various methods that can be performed on dictionary.

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