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2M3N24046 (Pages : 1) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Third Semester M.Sc Computer Science Degree Examination, November 2024

MCS3C01 – Advanced Database Management System

(2022 Admission onwards)

Time: 3 hours Max. Weightage : 30

PART A

Answer any 4 questions. Each question carries 2 weightage

1. What is an RDBMS? What are its advantages?
2. Write a note on database languages.
3. What is a recoverable schedule?
4. What is an ER data model? Give an example.
5. With a suitable example define transitive dependency.
6. What is a distributed database? Give examples.
7. What is a semi structured database?

(4x2 = 8 weightage)

PART B

Answer any 4 questions. Each question carries 3 weightage

8. What are the characteristics of database systems? Explain.
9. Briefly describe the three schema architecture of database systems.
10. Explain the concepts of stored programming in database systems.
11. Briefly explain various data models.
12. Briefly describe the concept of functional dependencies in relational databases.
13. Write on two phase locking protocol as a concurrency control scheme.
14. Briefly describe the motivation behind distributed databases.

(4x3 = 12 weightage)

Part C

Answer any 2 questions. Each question carries 5 weightage

15. Explain relational algebra and relational calculus. What is the expressive power of algebra and calculus?
16. With suitable examples, explain various normal forms in database design.
17. Explain in detail the concept of transaction management in RDBMS.
18. What is an OODBMS? Explain its need, advantages and drawbacks.

(2x5 = 10 weightage)

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FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Third Semester M.Sc Computer Science Degree Examination, November 2024

MCS3C02 – Fundamentals of Artificial Intelligence and Machine Learning

(2022 Admission onwards)

Time: 3 hours Max. Weightage : 30

PART A

Answer any *four* questions. Each question carries *two* weightage

1. What is meant by problem reduction? Explain.
2. What is the Turing test? Explain its importance in AI.
3. Distinguish Informed searching and Uninformed searching. Give examples.
4. Illustrate forward and backward reasoning.
5. What do you understand about Alpha-beta cut-offs?
6. Give any four characteristics of expert systems.
7. What is reinforcement learning? Give an application.

(4 x 2 = 8 weightage)

PART B

Answer any *four* questions. Each question carries *three* weightage

8. Explain any four applications and characteristics of AI problems.
9. Write note on Logical equivalences in propositional logic.
10. With suitable examples explain Depth First Search and Breadth First Search algorithms.
11. Illustrate advantages of predicate logic over propositional logic.
12. Demonstrate any four inference rules with examples.
13. Explain minimax search procedure.
14. Write notes on :
    a. semantic nets,
    b. frames and scripts.

(4 x 3 = 12 weightage)

PART C

Answer any *two* questions. Each question carries *five* weightage.

15. Give the state space representation for 8-tile problem. Explain its importance in solving AI problems.

16. With a suitable diagram, explain the expert system development life cycle.

17. Solve the given problems:

    i. Use constraint satisfaction

    S E N D +

    M O R E

    M O N E Y

    ---

    ii. Use propositional logic:

    Statements:

    b. If it is raining, then the ground is wet.

    c. If the sun is shining, then it is not raining.

    d. The ground is not wet.

    Conclusion:

    Determine whether the sun is shining.

18. Write notes on the following

    i. Supervised learning

    ii. Unsupervised learning

    iii. Deep learning.

    iv. Artificial neural network.

    v. Rote learning

(2 x 5 = 10 weightage)

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Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Third Semester M.Sc Computer Science Degree Examination, November 2024

MCS3C03 – Object Oriented Programming Concepts

(2022 Admission onwards)

Time: 3 hours Max. Weightage : 30

PART A

Answer any 4 questions. Each question carries 2 weightage

1. Represent Primitive Data Types in Java.
2. "Bytecode in Java is a set of instructions for the JVM". Comment on it.
3. What is the importance of 'new' operator in OOP?
4. Find the average of N positive integers, raising a user defined exception for each negative input.
5. Name and explain any four GUI components.
6. Mention any two types of Scripting Elements.
7. Define UML?

(4x2 = 8 weightage)

PART B

Answer any four questions. Each question carries 3 weightage

8. Explain about Objects, Attributes and Methods with examples.
9. Distinguish between WHILE & DO WHILE control structures.
10. Can a class have different Constructors? Explain.
11. How Multiple Inheritance is implementing in Java?
12. Explain about Byte Streams and Character Streams.
13. Differentiate between directive and action elements in JSP.
14. Discuss about Activity Diagrams.

(4x3 = 12 weightage)

Part C

Answer any two questions. Each question carries 5 weightage

15. Describe about Dynamic Method Dispatch.
16. Neatly present Thread life cycle.
17. Summarize InetAddress and URL in Java Networking.
18. Write notes on:

    (a) Deployment Diagrams (b) State Diagrams

(2x5 = 10 weightage)

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FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Third Semester M.Sc Computer Science Degree Examination, November 2024

MCS3E01(b)– Introduction to soft computing

(2022 Admission onwards)

Time: 3 hours Max. Weightage : 30

PART A

Questions 1 to 7. Answer any *four*. Each question carries *two* weightage.

1. What is classification?
2. What do you mean by discriminant functions?
3. List the GA operators .
4. What are the four primary premises of Genetic Algorithm?
5. What do you mean by feed forward network?
6. Differentiate Crisp relations and Fuzzy relations.
7. What is the analogy between music and optimization that is applied in Harmonic search ?

PART B

Questions 8 to 14. Answer any *four*. Each question carries *three* weightage

8. Differentiate two category classification and minimum error rate classification.
9. Explain how genetic algorithm works, with the help of a flowchart.
10. Explain the Perceptron learning mechanism.
11. What are the applications of fuzzy logic, illustrate.
12. What do you mean by Hopfield networks.
13. Explain briefly Swarm Intelligence.
14. Explain different evolutionary computing strategies.

PART C

Questions 15 to 18. Answer any *two*. Each question carries *five* weightage

15. Explain Bayes decision theory with an example.

16. Explain the different artificial neural network architectures.

17.

$$\bar{R} = \begin{array}{c} \\ x_1 \\ x_2 \\ x_3 \end{array} \begin{array}{c} \begin{array}{cccc} y_1 & y_2 & y_3 & y_4 \end{array} \\ \begin{bmatrix} 0.8 & 0.1 & 0.1 & 0.7 \\ 0.0 & 0.8 & 0.0 & 0.0 \\ 0.9 & 1.0 & 0.7 & 0.8 \end{bmatrix} \end{array}$$

$$\bar{S} = \begin{array}{c} \\ x_1 \\ x_2 \\ x_3 \end{array} \begin{array}{c} \begin{array}{cccc} y_1 & y_2 & y_3 & y_4 \end{array} \\ \begin{bmatrix} 0.4 & 0.0 & 0.9 & 0.6 \\ 0.9 & 0.4 & 0.5 & 0.7 \\ 0.3 & 0.0 & 0.8 & 0.5 \end{bmatrix} \end{array}$$

(a) $\overline{R} \cup \overline{S}$ (b) $\overline{R} \cap \overline{S}$ (c) R^c

18. Describe. (a) Support Vector Machines. (b). Evolutionary Algorithms.

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FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Third Semester M.Sc Computer Science Degree Examination, November 2024

MCS3E02(f)– Data ware housing and Data Mining

(2022 Admission onwards)

Time: 3 hours Max. Weightage : 30

PART A

Answer any Four (4) questions. Each question carries 2 weightage

1. How is a data warehouse different from a database? How are they similar?
2. Define a Data Warehouse. Discuss the role of a Data Warehouse in Data Mining.
3. What are Data Scrubbing Tools and Data Auditing Tools?
4. Expand Market Basket Analysis.
5. Recall various process steps in association rule mining.
6. What is a measure ? Explain various types of measures in data cube.
7. Define the concept of Spatial Mining.

PART B

Answer any Four (4) questions. Each question carries 3 weightage

8. List and explain various OLAP operations.
9. Define the following
   a. Multi-dimensional Data Models
   b. Data Cubes, and Lattice of a Cuboid
10. Identify and explain various strategies for Data Transformation.
11. Describe the Constraint-Based Frequent Pattern Mining strategy and list various constraints.
12. Summarize various techniques to improve the efficiency of Apriori-based mining.
13. Elaborate on the associative classification and the steps involved.
14. Explain Density-based and Grid-based methods of clustering with their characteristics.

PART C

Answer any Two (2) questions. Each question carries 5 weightage

15. Illustrate the architecture of the Data Mining system with a neat block diagram.

16. Define Missing values. Elaborate on various methods of filling in the missing values for attributes in data preprocessing.

17. Define Support and Confidence.

Transaction No.	Item
1	Tea, Cake, Cold Drink
2	Tea, Coffee, Cold Drink
3	Eggs, Tea, Cold Drink
4	Cake, Milk, Eggs
5	Cake, Coffee, Cold Drink, Milk, Eggs

(a) Calculate the support that a person buys Tea, also buy Cold Drink.

(b) Calculate the confidence that if a person buy Tea, also buy cake.

18. Recollect various requirements of clustering in data mining.