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**Presidency University**

**Bengaluru**

**School Of Computer Science and Engineering & Information Science**

**Summer Term End-Term Examinations, Aug 2024**

**Date**: 9.08.2024

**Time**: 1:00 PM to 4:00 PM

**Max Marks**: 100

**Weightage**: 50%

**Odd Semester**: 2023 - 24

**Course Code**: CSE 3006

**Course Name**: Artificial Intelligence and Neural Networks

**Department: SoCSE**

**Instructions:**

1. *Read the all questions carefully and answer accordingly.*
2. *Do not write any matter on the question paper other than roll number.*

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| **Q.No** | **Questions** | **Marks** | **CO** | **RBT** |
| 1 | 1. Define AI with its viewpoints. | 4 | CO1 | L1 |
| 1. Explain Agent. Write in details about goal based Agent. | 6 | CO1 | L2 |
| 1. Write a Short notes on    1. Semantic Networks    2. Frames | 10 | CO1 | L3 |
| OR | | | | |
| 2 | 1. Differentiate knowledge, Information and Data with suitable examples. | 4 | CO1 | L1 |
| 1. What is KBS System. Derive an KBS System for Automated Patient Monitoring System. | 6 | CO1 | L2 |
| 1. Draw the semantic network architecture for the statements given below    1. Tom is a cat.    2. Tom caught a bird.    3. Tom is owned by John.    4. Tom is ginger in colour.    5. Cats like cream.    6. The cat sat on the mat.    7. A cat is a mammal.    8. A bird is an animal.    9. All mammals are animals.    10. Mammals have fur | 10 | CO1 | L3 |

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| 3 | 1. List the components used for Problem formulation in State Space Searching | 4 | CO2 | L1 |
| 1. Explain in detail about Uninformed Search and Informed Search Strategies. | 6 | CO2 | L2 |
| 1. Find the most cost-effective path to reach from start state A to final state J using A\* Algorithm | 10 | CO2 | L3 |

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| 4 | 1. List out the differences between informed and uninformed Search Strategies. | 4 | CO2 | L1 |
| 1. Explain the algorithm used for BFS with suitable examples. | 6 | CO2 | L2 |
| 1. Derive a suitable path using Greedy best search algorithm for the below state space diagram | 10 | CO2 | L3 |

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| 5 | 1. What is uncertainty and what are the causes of uncertainty | 4 | CO3 | L1 |
| 1. Explain Bayes theorem in detail. | 6 | CO3 | L2 |
| 1. You are planning a picnic today, but the morning is cloudy. Oh no! 50% of all rainy days start off cloudy!. But cloudy mornings are common (about 40% of days start cloudy) And this is usually a dry month (only 3 of 30 days tend to be rainy, or 10%)   What is the chance of rain during the day? | 10 | CO3 | L3 |

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| 6 | 1. In a class, there are 70% of the students who like English and 40% of the students who likes English and mathematics, and then what is the percent of students those who like English also like mathematics? | 4 | CO3 | L1 |
| 1. From a standard deck of playing cards, a single card is drawn. The probability that the card is king is 4/52, then calculate posterior probability P(King|Face), which means the drawn face card is a king card. | 6 | CO3 | L2 |
| 1. Explain in details about the three types of Probabilities used in Artificial Intelligence. | 10 | CO3 | L3 |

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| 7 | 1. What is the role of activation functions in Neural Networks? | 4 | CO4 | L1 |
| 1. Explain in detail about the various activation function used in constructing Neural Networks. | 6 | CO4 | L2 |
| 1. Given a business problem, there is no hard and fast rule to determine the exact number of neurons and hidden layers required to build a neural network architecture. The optimal size of the hidden layer in a neural network lies between the size of the output layers and the size of the input. What are the network architectures can be adopted to design such neural networks. | 10 | CO4 | L3 |

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| 8 | 1. Explain the types of Learning used Neural Networks. | 4 | CO4 | L1 |
| 1. Explain the types of learning laws adopted in unsupervised neural networks. | 6 | CO4 | L2 |
| 1. Suppose that a credit card company decided to deploy a new system for assessing credit worthiness of its customers. The new system is using a neural network with a supervised learning algorithm. Explain various neural network topologies with suitable diagrams to construct banking system. | 10 | CO4 | L3 |

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| 9 | 1. Define frame with suitable examples. | 4 | CO1 | L1 |
| 1. Explain the process of knowledge organization in detail. | 6 | CO1 | L2 |
| * 1. Construct the following set of prepositions using Semantic Nets: Tom is a cat. Tom caught a bird. Tom is owned by John. Tom is ginger in colour. Cats like cream. The cat sat on the mat. A cat is a mammal. A bird is an animal. All mammals are animals. Mammals have fur. | 10 | CO1 | L3 |

OR

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| 10 | 1. How to define a problem in terms of State space searching. | 4 | CO2 | L1 |
| 1. Show that the following logic formulas are satisfying tautology and prove using suitable truth table: a) ┐P->P b) ┐((P-> Q) ∩P->Q c) (┐P-> ┐Q)=>(Q->P) | 6 | CO2 | L2 |
| 1. Consider the following graph which marks the order in which the nodes would be discovered in BFS.   https://miro.medium.com/v2/resize:fit:393/0*RYcbN7yY9hhs6_wW.png  Consider start node is 1 and goal node is 12. | 10 | CO2 | L3 |