Total No. of Questions: 05 Total No. of Printed Pages: 02

Roll No. _____

BTCS502N

B.Tech./ B.Tech. + M.B.A. / B.Tech. + M.Tech. (CSE, CSE-CF, CSE-BDA, CSE-ES, CSE-MA, CSE-ICS, IT, BDCE-Impetus)

V Semester Examination, June-July 2024

Introduction to Artificial Intelligence

Choice Based Credit System (CBCS)

Time: 3 Hrs. **Maximum Marks: 60**

Minimum Pass Marks: 24

Note: (1) All questions carry equal marks, out of which part 'A' and 'B' carry 3 marks and part 'C' carries 6 marks.
(2) From each question, part 'A' and 'B' are compulsory and part 'C' has internal choice.
(3) Draw neat diagram, wherever necessary.
(4) Assume suitable data wherever necessary.

Q.1(A) What is artificial intelligence? What are the common uses and applications of AI? **03**

(B) How does agent works in environment? **03**

(C) Differentiate between tree and graph. Is there any difference between B-Tree and B^{+}-? Explain. **06**

OR

What do you understand by state space representation of a problem? Explain.

Q.2(A) What is heuristic search? Is it like random search? Explain **03**

(B) Differentiate between breadth first search and depth first search. **03**

(C) What is the difference between heuristic search and best first search? **06**

OR

Write a short note on A* algorithm and game search.

Q.3(A) What is the probability of getting a sum 9 from two throws of a dice? **03**

(B) What is Bayesian network? Write its applications. **03**

(C) A person uses his car 30% of the time, walks 30% of the time and rides the bus 40% of the time as he goes to work. He is late 10% of the time when he walks; he is late 3% of the time when he drives; and he is late 7% of the time he takes the bus. What is the probability he took the bus if he was late? What is the probability he walked if he is on time? **06**

OR

Explain hidden Markov model in detail with its applications.

Q.4(A) What are the essential elements in a Markov Decision Process? **03**

(B) How does the Markov Decision Process Work? **03**

Contd.....

(C) How does Markov Decision Process helps in reducing wait time at a traffic intersection? Explain. **06**

OR

What do you understand by Partially Observable Markov Decision Processes? How is it different from MDP?

Q.5(A) How does Reinforcement Learning work? **03**

(B) What is the difference between Active and Passive Reinforcement learning? **03**

(C) What is Q Learning? How to make Q-Table for an agent? **06**

OR

What is the concept of TD learning? Explain different types of TD learning algorithms.

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