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प्रज्ञानं ब्रह्म

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# MANIPAL INSTITUTE OF TECHNOLOGY

(Constituent Institute of Manipal University)

MANIPAL-576104

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MANIPAL INSTITUTE OF TECHNOLOGY

SEVENTH SEMESTER B.Tech. (CSE) DEGREE END SEMESTER EXAMINATION

NOV./DEC. 2012

**ARTIFICIAL INTELLIGENCE (CSE 403.3)**

DATE: 01-12-2012

TIME: 3 HOURS MAX.MARKS: 50

**Instructions to Candidates**

- Answer **any five** full questions.

1 a) Give any one definition of the term ‘ Artificial Intelligence ‘ and justify it in your own words.
b) Clearly state Travelling Sales Person(TSP) problem in your own words and analyze along different dimensions.
c) What is state space search of a problem? Write the production rules to solve water jug problem.

(2+3+5) Marks

2 a) What is knowledge and how is it different from data? Give a suitable example to show the difference between them.
b) Explain why Best First Search is called a heuristic technique, as compared to Depth First and Breadth First Searches, which are not.
c) Write A* search algorithm and trace the algorithm with suitable example.

(2+3+5) Marks

3 a) What is Knowledge Representation? Show its representation and mapping schematically.
b) Discuss the advantages of Predicate Logic over Propositional Logic. Justify with appropriate example.
c) Consider the following sentences

i. All animals either live on land or in water
ii. All Pompeians were either loyal to Caesar or hated him.
iii. People only try to assassinate rulers they are not loyal to.
iv. You can fool some of the people all of the time.
v. All purple mushrooms are poisonous.

Convert the sentences into predicate form.

(2+3+5) Marks

4 a) Discuss forward and backward reasoning with example.
b) Explain matching technique used to answer PROLOG queries with suitable example.
c) What is Alpha-Beta pruning? How does α-pruning improves the efficiency of the Minimax technique? Show using an example.

(2+3+5) Marks

5 a) By taking one example discuss Problem reduction in state space search?
b) Write Mini-max with alpha-beta pruning search algorithm to solve two-player game problem.
c) For the Blocks World problem given below, use Hill Climbing to show the next 3 best moves. State and use a suitable global heuristic.

Initial state: (ABCD) (E) final state: (DBA) (EC)

(2+3+5) Marks

6 a) Is inferencing possible using Semantic Nets? Justify your answer.
b) Suppose we are given the probability of Rahul has a cold as 0.25, the probability of Rahul was observed sneezing when he had cold in the past as 0.9 and the probability of Rahul was observed sneezing when he did not have cold as 0.20. Find the probability of Rahul having a cold given that he sneezes.
c) Show a Semantic Net representation of the following knowledge:

*Tom is a cat.*
*Tom caught a bird.*
*Tom is owned by John.*
*Tom is ginger in colour.*
*Cats like cream*
*The cat is sat on the mat.*
*A cat is a mammal.*
*All mammals are animals.*
*Mammals have fur.*

(2+3+5) Marks

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