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BICS-021

B.Tech. – VIEP – COMPUTER SCIENCE AND ENGINEERING (BTCSVI)

Term-End Examination

December, 2015

BICS-021 : ARTIFICIAL INTELLIGENCE

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any **seven** questions. All questions carry equal marks.*

1. (a) Define Intelligence. What are the different approaches in defining artificial intelligence ? *5*

(b) What is a search technique ? Explain the hill-climbing algorithm. *5*

2. (a) Describe the various knowledge representation methods. *5*

(b) Trace the constraint satisfaction procedure for solving the following cryptarithmetic problem : *5*

$$\begin{array}{r} \text{CROSS} \\ +\,\text{ROADS} \\ \hline \text{DANGER} \end{array}$$

3. Given a full 5-gallon jug and an empty 2-gallon jug, the goal is to fill the 2-gallon jug with exactly one gallon of water.

For solving this problem,

(a) Create the search tree.

(b) Discuss various search strategies.

(c) Which search strategy is appropriate for this problem ? *10*

4. Explain the forward chaining process and efficient forward chaining with examples. State their usage. *10*

5. What are the various types of reasoning methods ? Also discuss Bayes' theorem. *10*

6. (a) Describe about decision tree learning. *5*

(b) Explain the explanation-based learning. *5*

7. Convert the following English statements to statements in first order logic : *10*

(a) Every boy or girl is a child.

(b) Every child gets a doll or a train or a lump of coal.

(c) No boy gets any doll.

(d) No child who is good gets any lump of coal.

(e) Jack is a boy.

Using the above five axioms construct a proof by resolution of the statement :

"If Jack doesn't get a train, then Jack is not a good boy."

8. What are the different game playing techniques ? Explain minimax search procedure with a neat illustration. *10*

9. Explain how the meta-knowledge is used in expert system. Also discuss various learning techniques used in expert system. *10*

10. Write short notes on any ***two*** of the following : *2×5=10*

    (a) AO* Algorithm

    (b) Scripts

    (c) Alpha Beta Cut-off