B.E. (IT) (Sem -VII) (CBSGS)

(Time: 3 Hours)   Total Marks:80

N.B.: (1)   Question **No. 1** is **compulsory**.

(2)   Attempt any **three** out of remaining **five**.

Q1. a)   What is PEAS descriptor? Give PEAS Descriptor for Taxi Driver.   4

b)   Write a note on conditional probability and its role in AI.   4

c)   Solve following Cryptarithmetic problem

SEND+MORE=MONEY   4

d)   Differentiate between prepositional and predicate logic.   4

e)   Explain Expert system Shell in short.   4

Q2. a)   Given a full 4-gallon jug and an empty 3-gallon jug, the goal is to fill the   10
4-gallon jug with exactly 2-gallons of water. Give state space representation.

b)   Explain Hill Climbing and its Drawback in details.   5

c)   Explain A* Algorithm with an example.   5

Q3. a)   Consider the given game tree. Apply Alpha beta Pruning on following   10
example where   - max node, ⬤ -min node
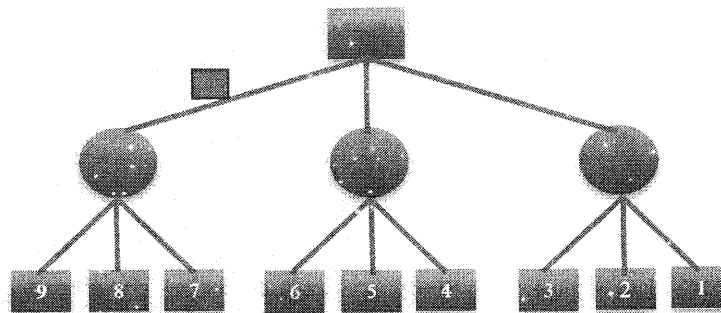
b)   Draw and Explain the Expert System Architecture.   5

c)   Formulate the state space search problems for 8 puzzle problem.   5

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Q4. a)   Illustrate the Resolution Proof   10

The law says that it is a crime for an American to sell weapons to hostile nations. The country Nono, an enemy of America, has some missiles, and all of its missiles were sold to it by Colonel West, who is American.

(i) Represent the above sentences in first order predicate logic (FOPL).

(ii) Convert them to clause form.

(iii) Prove that "Colonel West is a criminal" using resolution technique.

    b)   Give the comparative analysis of BFS, DFS, Depth Limit, Iterative deepening   5
and Bidirectional search strategies with respect to Time Complexity, Space
Complexity, Optimality and Completeness.

    c)   List Down all types of Agents. Explain Learning agent with block diagram.   5

Q5. a)   Write a prolog program for Factorial.   5

    b)   Represent the following sentence into FOPL.   10

(i) Everyone who loves all animals is loved by someone.

(ii) Ravi likes all kind of food.

(iii) Every gardener likes the sun.

(iv) Everybody loves somebody.

(v) Apples are food.

    c)   Explain a partial order planning with example.   5

Q6. Write short notes on (Any Four):   20

    a) Forward chaining and Backward chaining

    b) Decision Tree

    c) Bayes theorem

    d) Inductive Learning and Rote Learning

    e) Properties of Agent Task Environment