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**B. E. (Seventh Semester) Examination,
April-May, 2020**

(Old Scheme)

(IT Engg. Branch)

ARTIFICIAL INTELLIGENCE & EXPERT SYSTEMS

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : Attempt all questions. Part (a) from each question is compulsory. Attempt any two parts from (b), (c) and (d) of each question.

Unit-I

1. (a) List down the characteristics of intelligent agent? 2

[2]

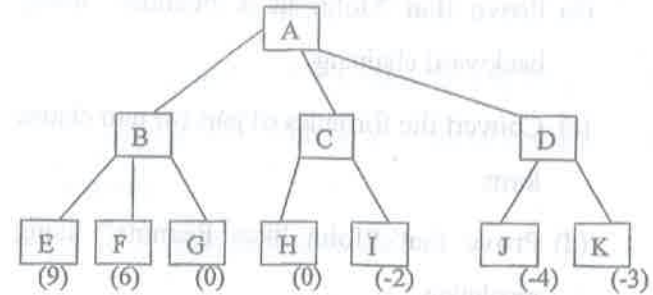
- (b) Define missionaries and cannibal problem with problem space and solve it. 7
- (c) Explain BF's and DF's with suitable example. Write advantages and disadvantages of both. 7
- (d) Discuss the major building blocks for AI based problem solving? Differentiate between S-R Agent model and goal-based agent modelling design. 7

Unit-II

2. (a) What role does prenex normal form play in obtaining clausal forms of predicate expression? 2
- (b) Illustrate the concept of constraint satisfaction AI-Technique to solve the following crypt-arithmetic problem : 7
- CROSS + ROADS = DANGER
- (c) Write short technical notes on the following : 7
- (i) AO* algorithm
- (ii) Hill Climbing
- (d) Consider the 2-ply search as shown below : 7

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[3]



If the first player is a maximizing player. What move should be chosen under the mini-max strategy?

Unit-III

3. (a) Define LISP? 2
- (b) Consider the following sentences : 7
- (i) John likes all kinds of food.
- (ii) Apples are food.
- (iii) Chicken is food.
- (iv) Anything any one eats and isn't killed by is food.
- (v) Bill eats peanuts and is still alive.
- (vi) Sue eats everything Bill eats.
- (a) Translate these sentences into formulas in predicate logic.

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PTO

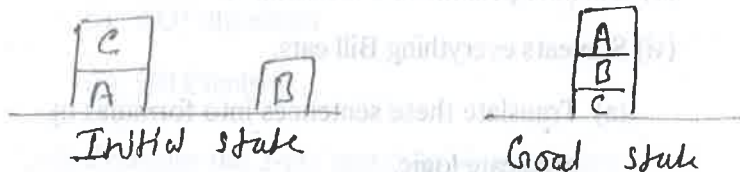
[4]

- (b) Prove that "John likes Peanuts" using backward chaining.
- (c) Convert the formulas of part (a) into clause form.
- (d) Prove that "John likes Peanuts" using resolution.
- (e) Use resolution to answer the question. "What food does sue eat".

- (c) Describe in detail the steps involved in the knowledge engineering process? 7
- (d) Explain Monkey-Bananas problem in prolog? 7

Unit-IV

- 4. (a) Give general approaches to NLP? 2
- (b) Solve the following block world problem with the help of Goal-Set planning techniques. 7



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- (c) Explain different types of probabilistic reasoning? 7
- (d) Write a suitable RTN Grammar and RT network recognizes the syntactic validity of the following sentence : 7
"John slept on table".

Unit-V

- 5. (a) For which knowledge domain, was MYCIN expertized? Which language was chosen to implement MYCIN rules? 2
- (b) Write a short note on : 7
 - (i) Role learning
 - (ii) Knowledge Acquisition
- (c) What are the characteristics of an expert system? Draw a block diagram of an expert system and describe each block briefly. Show how does the working of an experts system differ from a traditional software? 7
- (d) Discuss the details of ELIZA program as an expert system interface? 7