Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020
Artificial Intelligence

Time: 3 hrs. Max. Marks: 100

Note: ***Answer FIVE full questions, choosing ONE full question from each module.***

Module-1

1 a. Explain the components and categories of production system. List the requirement of good control strategies. **(10 Marks)**

b. Explain steepest Hill climbing technique with an algorithm. Comment on its drawbacks and how to overcome these drawbacks. **(10 Marks)**

OR

2 a. Consider trying to solve the 8-puzzle instance given below using Hill climbing. Apply any heuristic function appropriate to solve the problem. **(10 Marks)**

Start state

2	8	3
1		4
7	6	5

End state

1	2	3
8		4
7	6	5

b. List and explain the problem characteristics which must be analyzed before deciding on a proper heuristic search. **(10 Marks)**

Module-2

3 a. Consider the following sentences:

- John likes all kinds of food.
- Apples are food.
- Anything anyone eats and isn't killed by is food.
- Bill eats peanuts and is still alive.
- Sue eats everything Bill eats.

(i) Translate all the sentences into formulas in predicate logic.
(ii) Convert formulas from previous step into clause form.
(iii) Prove that John likes peanuts using resolution. **(12 Marks)**

b. Differentiate between forward and backward reasoning and list the factors that influences the choice between them. **(08 Marks)**

OR

4 a. Define CNF. Give an algorithm for converting given proposions to CNF. **(10 Marks)**

b. Explain the different approaches used for knowledge representation and list the qualities a good knowledge representation system should possess. **(10 Marks)**

Module-3

5 a. Explain Justification based Truth Maintenance System (JTMS). What are the two critical criterion that must be met during labeling of JTMS and illustrate with suitable example. **(10 Marks)**

b. What are portioned semantic nets? Express the following quantified expression using semantic nets:

(i) Every dog has bitten a mail carrier.
(ii) Every dog in town has bitten the constable. **(10 Marks)**

OR

6 a. What are the key issues in non-monotonic reasoning system? Explain the two approaches used for logic representation for non-monotonic reasoning. **(10 Marks)**

b. Define Bayes theorem. What are its limitations? How certainty factor is used to overcome its limitation? **(10 Marks)**

Module-4

7 a. Explain the conceptual dependency representation of an event or action. **(10 Marks)**

b. Explain MINMAX search with appropriate algorithm. **(10 Marks)**

OR

8 a. What is global ontology? What are the distinctions provided by Global ontology for defining a 'thing'? **(10 Marks)**

b. What are scripts? Explain the important components of a script with an example. **(10 Marks)**

Module-5

9 a. Explain the usage of Soundex Algorithm for phonetic based spell checking with suitable example. **(10 Marks)**

b. Write a note on knowledge acquisition. **(10 Marks)**

OR

10 a. List and explain the steps involved in natural language processing. **(10 Marks)**

b. What is Analogy based learning? Differentiate between transformations analogy and derivational analogy. **(10 Marks)**