

[4]

- d) Explain in short the working of MYCIN expert system with inference Rules.

OR

Explain how Bayesian statistics provides reasoning under various kinds of uncertainty.

Total No. of Questions :5]

[Total No. of Printed Pages :4

Roll No

MCA - 401

MCA. IV Semester

Examination, December 2016

Artificial Intelligence and Applications

Time : Three Hours

Maximum Marks : 70

- Note:** i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
ii) All parts of each question are to be attempted at one place.
iii) All questions carry equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.
iv) Except numericals, Derivation, Design and Drawing etc.

Unit - I

1. a) Write the syntax to define a function in LISP with example.
- b) Differentiate between recursion and iteration with example.
- c) Write the characteristics of AI applications.
- d) Explain the characteristics of problem, Also categories the problems handled by AI.

OR

Describe the structure of LISP program. Also write the properties of lists and arrays.

[2]

Unit - II

- 2. a) Write the production system for water jug problem.
- b) Differentiate between DFS and BFS on at least two points.
- c) What is Heuristic search? Explain with example. Also write the heuristic function for
 - i) Tic-Tac-Toe
 - ii) Travelling Salesman Problem
- d) Write AO* Algorithm? Also explain the limitation of AO* Algorithm.

OR

Explain constraint satisfaction. Solve the following crypt arithmetic:

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

Unit - III

- 3. a) Differentiate between prepositional versus first order logic.
- b) How can you represent the resolution of predicate logic?
- c) Draw the semantic network for the following sentences:
 - i) The dog bites a mail carrier.
 - ii) Every dog bites a mail carrier.
- d) Define Script? Also write a script for a restaurant scene.

OR

[3]

Consider the following sentences:-

- i) John likes all kinds of food
- ii) Apples are food
- iii) Chicken is food
- iv) Anything anyone isn't killed by is food
- v) Bill eats peanuts and is still alive
- vi) Sue eats everything bill eats.
 - 1) Translate these sentences into formulas in predicate logic.
 - 2) Prove that john likes peanuts using backward chaining.
 - 3) Convert the formulas of apart into clause form.
 - 4) Prove that john likes peanuts using resolution.

Unit - IV

- 4. a) Define Alpha Beta cutoff in Minimax search procedure.
- b) Explain the concept of planning with state space search using suitable example.
- c) Explain the steps of Natural Language Processing.
- d) Perform bottom up and top down parsing for the input "the wumpus is dead".

OR

Write a short note on Recursive Transition Network (RNT) with example.

Unit - V

- 5. a) Define conditional probability with example.
- b) Explain inference engine in Expert system.
- c) Define bayes theorem.