

GUJARAT TECHNOLOGICAL UNIVERSITY
BE – SEMESTER – VIII. EXAMINATION – WINTER 2016

Subject Code: 180703

Date: 22/10/2016

Subject Name: Artificial Intelligence (Department Elective - II)

Time: 02:30 PM to 05:00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

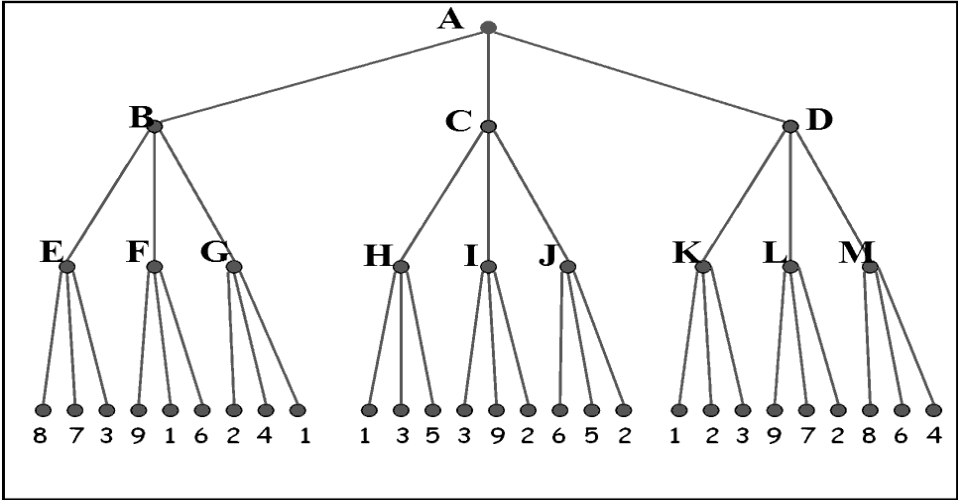
- Q.1 (a)** Discuss following: **07**
i. Turing Test
ii. State space of a problem
- (b)** Analyze (a) 8-puzzle, (b) Chess and (c) Tower of Hanoi problems with respect to the following problem characteristics: **07**
i. Is the problem decomposable?
ii. Can solution step be ignored?
iii. Is the good solution absolute or relative?
iv. Is the solution state or a path?
v. What is the role of knowledge?
- Q.2 (a)** Describe the components of a semantic net. **07**
- (b)** Consider the following sentences: **07**
• Raj likes all kinds of food.
• Apples are food.
• Anything anyone eats and isn't killed by is food.
• Sachin eats peanuts and is still alive.
• Vinod eats everything Sachin eats.
- Now, attempt following:
i. Translate these sentences into formulas in predicate logic.
ii. Use resolution to answer the question, "What food does Vinod eat?"
- OR**
- (b)** What is wrong with the following arguments? **07**
• Men are widely distributed over the earth
• Socrates is a man.
• Therefore, Socrates is widely distributed over the earth.
- How should the facts represented by these sentences be represented in logic so that this problem does not arise?
- Q.3 (a)** Explain AO* algorithm with an example. **07**
- (b)** Enlist and Explain various phases involved in Natural Language Processing. **07**
- OR**
- Q.3 (a)** Explain non-monotonic reasoning in detail. **07**

- (b) Solve the Crypt – arithmetic problem with the following constraints. Give solution steps. 07
- Constraints :- (i) Use decimal arithmetic
(ii) No two letters possess same digit.

	C	R	O	S	S	
+	R	O	A	D	S	

	D	A	N	G	E	R

- Q.4 (a) Explain how list is used in Prolog. Discuss how following list-functions can be implemented in Prolog: 07
- (a) Checking membership of an element in a given list, (b) concatenating two lists, and (c) deleting an element from a given list.
- (b) Explain cut and fail predicate with example. 07
- OR**
- Q.4 (a) Write a Prolog program to find factorial of a given number. 07
- (b) Discuss Hill climbing and Simulated Annealing. State the differences between these two methods. 07
- Q.5 (a) Consider the following 2 player game tree in which static scores are given from the first player's point of view: 07



- Suppose the first player is the maximizing player. What move should be chosen? Why? Use Mini-Max search to solve.
Also explain limitations of Mini-Max search. How to overcome them?
- (b) Describe Expert System development procedure. 07
- OR**
- Q.5 (a) Discuss perceptron learning algorithm for training a neural network. Also discuss different activation functions. 07
- (b) Discuss following: 07
- i. Bayesian network
 - ii. Fuzzy logic
