

Nirma University
Institute of Technology
Semester End Examination (IR), May - 2014
B. Tech., Semester-VI
2CE007 Artificial Intelligence (Institute Elective)

Roll /
Exam No.

Supervisor's Initial
with Date

Time: 3 Hours

Max Marks: 100

- Instructions:
1. Attempt all questions
 2. Figures to right indicate full marks
 3. Assume necessary data.
 4. Draw neat sketches wherever necessary.

Section – I

Q-1 Do as directed : (3x6=18) [18]

- A** Justify the statement “Real world problems are hard to solve with Artificial Intelligence techniques”. [03]
- B** Describe the Simulated Annealing approach to solve a problem [03]
- C** Suppose you design a machine to pass the Turing test. What are the capabilities such a machine must have? [03]
- D** Although Heuristic does not claims for completeness and giving optimal solution, still its uses are advocated, comment and justify your explanations. [03]
- E** Discuss how FOPL is powerful than propositional logic? [03]
- F** What do you mean by Graceful Decay of Admissibility with respect to A* algorithm? [03]

Q-2 Do as directed : [14]

- A** Explain Means-end analysis method applied to house hold robot domain. (08)
- B** Write an algorithm of resolution process for propositional logic. (06)

OR

B Explain the working of AO* algorithm with example. (06)

Q. 3 Do as directed : [18]

A Consider a sliding puzzle with the start configuration as given below: (08)

B		B		B		W		W		W		E
---	--	---	--	---	--	---	--	---	--	---	--	---

Where a B is black tile, W is white tile, and E is empty cell. The goal of puzzle is to have all the white tiles to left of all the black tiles with empty cell at the extreme.

W		W		W		B		B		B		E
---	--	---	--	---	--	---	--	---	--	---	--	---

The puzzle has the following move:

'A tile can move to an adjacent empty with cost 1 or may hop over into empty cell with cost 2'

- Specify rules and control strategy for a problem.
- Find solution using A* algorithm.

B What factors decides the choice of reasoning between forward or backward? With respect to 8-puzzle problem which is better? (04)

C Write an algorithm for unification process in logic and explain it with one example. (06)

OR

C Explain the Hill climbing algorithm with suitable example. (06)

Section – II

Q- 4 Do as directed :

[18]

(A) Consider the following English sentence:

(06)

- Anything anyone eats is called food.
- Mita likes all kinds of food.
- Burger is a food.
- Mango is a food.
- John eats pizza.
- John eats everything Mita eats.

Translate these sentences into formulae in predicate logic and then to clauses.

Using resolution prove: "Mita likes pizza and burger"

(B) Discuss the rule based system with example

(06)

(C) Draw the semantic network for representing the following English sentence :

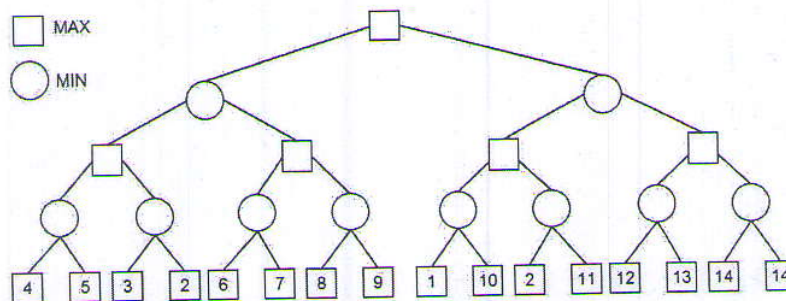
(06)

1. Teacher who work hard are liked by student. Mary is a hardworking teacher. John is a student.
2. Black dog named prince has a tail which is an animal, a kind of mammal.

Q-5 Do as directed :

[16]

(A) Use Alpha-Beta pruning to compute the mini-max value at each node for the game tree below. Assume children node are visited left to right. Show the alpha and beta values at each node. Show which branches are pruned.



- (B) Describe constraint satisfaction search procedure. Apply the same for (06)
solving following crypt-arithmetic problem.

LOGIC
+ LOGIC

PROLOG

OR

- (B) (1) Discuss the architecture of typical Expert system. Write the (04)
functions of each module of it.
(2) Write only the purpose of the following expert system: (02)
1. DENDRAL
2. MYCIN

- (C) Express the term "Machine Learning". Discuss two applications where (04)
the use of machine learning is suitable.

Q-6 Do as directed : [16]

- (A) Develop a complete Frame-based system for Educational University. (06)
(B) What do you mean by reasoning with uncertain knowledge? Briefly (06)
discuss the following reasoning methods.
• Inductive reasoning
• Abductive reasoning
• Deductive reasoning

OR

- (B) Illustrate the Bayesian network with example. (06)
(C) Differentiate between monotonic and non-monotonic reasoning with (04)
example