

GANPAT UNIVERSITY**B. Tech. Semester VII (Computer Engineering/ Information Technology)****Regular Examination November-December 2013****2CE703/2IT703: Artificial Intelligence****[Time: 3 Hours]****[Total Marks: 70]****Instructions:**

1. Figures to the right indicate full marks
2. Each section should be written in a separate answer book
3. Be precise and to the point in your answer

SECTION-I**Q-1 Answer the following:**

- (a) Discuss the problem characteristics for the following: [8]
 i. Tower of Hanoi
 ii. Tic-Tac-Toe
- (b) Write an advantage and disadvantage of DFS and BFS. [4]

OR**Q-1 Answer the following:**

- (a) What is Problem Reduction? Discuss AND-OR Graphs with suitable example. [6]
 (b) Discuss Best First Search Technique. [6]

Q-2 Answer the following:

- (a) Explain A*algorithm in detail. [6]
 (b) When $h'(n)$ overestimate $h(n)$. Discuss with suitable example. [5]

OR**Q-2 Answer the following:**

- (a) Explain Steepest Ascent Hill Climbing in detail. [6]
 (b) When $h'(n)$ underestimate $h(n)$. Discuss with suitable example. [5]

Q-3 Answer the following:

- (a) Define: Heuristic search technique [2]
 (b) When Hill climbing will be fail. Which are the solutions to overcome to those problems? Explain with Block World Problem. [6]
 (c) Write an output of following programs. (assume domains and predicates) [4]

%goal :- start

start:-

write("1"),

go, !.

start:-

write("2"), !.

go:-

!,

fail.

%goal :- go

go:-

write("HELLO"), test, write("UVPCE").

go:-

write("7th CE-IT"),test.

test:-

!, fail, write("TEST1").

test:-

write("TEST2").

(P.T.O)

SECTION-II**Q-4 Answer the following:**

- (a) Trace the constraint satisfaction procedure to solve the following cryptarithmic problem: [8]

$$\begin{array}{r} \text{C R O S S} \\ + \text{R O A D S} \\ \hline \end{array}$$

D A N G E R

- (b) Compare Propositional Logic and Predicate Logic. [4]

OR

Q-4 Answer the following:

- (a) Consider the following sentences: [8]

- i. John like all kinds of food.
- ii. Apples are food.
- iii. Chicken is food.
- iv. Anything anyone eats and isn't killed by is food.
- v. Bill eats peanuts and is still alive.

Give following answers.

- i. Translate these sentences into formulas in predicate logic.
- ii. Prove that John likes peanuts using backward chaining.
- iii. Convert the formulas of part (i) into clause form.
- iv. Prove that john likes peanuts using resolution.

- (b) Discuss Resolution in propositional Logic. [4]

Q-5 Answer the following:

- (a) Discuss alpha-Beta Cutoff with suitable example. [6]
- (b) Write the examples where hill climbing and best first search behave (a) similarly [5]
(b) differently.

OR

Q-5 Answer the following:

- (a) Suggest the strategy to solve the Tic-Tac-Toe problem. Define heuristic for that. [6]
Derive the complete procedure to play the game.
- (b) When would best first search be worse than a simple breadth first search? [5]

Q-6 Answer the following:

- (a) Prove Fuzzy De Morgan's law: $(A \cap B) = (A^c \cup B^c)^c$ [5]
- (b) Discuss: Semantic Nets [4]
- (c) Solve degree of subset hood using Fit-Violation theorem. [3]

	X1	X2	X3	X4	X5
A	0.2	0.6	0.7	0.9	0
B	0.3	0.5	0.2	0.8	1

End of Paper