Student Exam No._____

GANPAT UNIVERSITY

B. Tech. Semester: VII (Computer Engineering/Information Technology)

Regular Examination November – December 2014

2CE703/2IT703: Artificial Intelligence

Time: 3 Hours **Total Marks: 70**

Instruction: 1 Figures to the right indicate full marks of question
2 All questions are compulsory
3 Each section should be written in a separate answer book

Section – I

Que. – 1 (a) What is Artificial Intelligence? Discuss at least five application of AI in different areas in detail. **[6]**

(b) Classify the problems according to characteristics of AI problems. **[6]**

OR

Que. – 1 (a) You are given two jugs of water, a 4-gallon one and a 3-gallon one. Neither has any measuring marker on it. There is a pump that can be used to fill the jugs with water. How can you get exactly 2 gallons of water into the 4-gallon jug? Suggest and discuss appropriate strategies for it. **[6]**

(b) Discuss the cases when hill climbing is fail. What are the solutions to overcome those problems? Discuss it with block world problem. **[6]**

Que. – 2 (a) Describe when h' underestimates h with suitable example. **[3]**

(b) Discuss the requirement of good control strategy. **[4]**

(c) Convert following statements into predicate logic. **[4]**

i. All Romans were either loyal to Caeser or hated him.
ii. No mortal lives longer than 150 years.
iii. People only try to assassinate rulers they are not loyal to.
iv. All the courses in the basket weaving department are easy.

OR

Que. – 2 (a) Describe when h' overestimates h with suitable example. **[3]**

(b) Distinguish fail and cut predicate with appropriate example. **[3]**

(c) What is problem reduction? Explain AND-OR graph with suitable example having at least 10 nodes. **[5]**

Que. – 3 (a) Explain A* Algorithm with suitable example. **[6]**

(b) Define following terms in detail. **[6]**

i. Chronological Backtracking
ii. Operationalization
iii. Non-recoverable problem

Section – II

Que. – 4 (a) Construct the partition semantic net of following statement. **[4]**

i. Every dog has bitten a mail carrier.

ii. Every dog in town has bitten the constable.

(b) What is constraint satisfaction? Solve the cryptarithmetic puzzle. **[8]**

```
  S E N D
+ M O R E
-----------
M O N E Y
```

OR

Que. – 4 (a) Define frame in brief. **[2]**

(b) Consider the following sentences: **[10]**

1. John like all kinds of food.
2. Apples are food.
3. Chicken is food.
4. Anything anyone eats and isn't killed by is food.
5. Bill eats peanuts and is still alive.
6. Sue eats everything Bill eats.

Give following answers.

a) Translate these sentences into formulas in predicate logic

b) Prove that John likes peanuts using backward chaining

c) Convert the formulas of part (a) into clause form.

d) Prove that John likes peanuts using resolution

e) Use resolution to answer the question, "What food does Sue eat?

Que. – 5 (a) Prove Fuzzy Demorgan's Law. $(A \cup B) = (A^c \cap B^c)^c$ **[4]**

(b) Explain MiniMax Search procedure and discuss why Alpha-Beta cutoffs used in it. **[7]**

OR

Que. – 5 (a) Write a short note on "Expert System". **[5]**

(b) Imagine that you have a large bag of candy. You want to know the ratio of cherry to lime in the bag. Discuss this example with baye's theorem. **[6]**

Que. – 6 (a) Explain Artificial Neural Network briefly. **[6]**

(b) Define following terms in detail. **[6]**

i. Mutually-disjoint-with

ii. State space search

iii. Production system

END OF PAPER