Student Exam No._____

GANPAT UNIVERSITY

B.TECH SEMESTER: VII (COMPUTER ENGINEERING/ INFORMATION TECHNOLOGY)

REGULAR EXAMINATION NOV-DEC 2015

2CE703/2IT703: ARTIFICIAL INTELLIGENCE

Time: 3 Hours] [Total Marks: 70

Instruction: 1 Assume suitable data, if required.
2 Figures to right side indicate full marks.
3 Each section should be written in a separate answer book.
4 Be precise and to the point in your answer.

Section - I

Que. – 1 [A] Explain breadth-first search with water jug problem. Also discuss its advantages and disadvantages. [6]

[B] Discuss three task domains of Artificial Intelligence. [3]

[C] What is a heuristic function? What is its use in Artificial Intelligence? [3]

OR

Que. – 1 [A] Explain depth-first search with water jug problem. Also discuss advantages and disadvantages of it. [6]

[B] Discuss seven key dimensions to analyze the problem. [6]

Que. – 2 [A] Differentiate between best first search and hill climbing. Explain it with the help of a suitable example. [6]

[B] What is problem reduction? Find the minimum cost for matrix multiplication of three matrices A, B and C using problem reduction if dimensions of given matrices are A= [3*4], B= [4*10] and C= [10*1]. [5]

OR

Que. – 2 [A] Discuss scenarios when h' underestimates h and h' overestimates h with suitable example. [6]

[B] Describe means-ends analysis techniqne with the help of a suitable example. [5]

Que. –3 [A] Solve following cryptarithmetic puzzle. [6]

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  B E S T
+ M A D E
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M A S E R
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[B] Explain steepest ascent hill climbing. [4]

[C] How can nearest neighbor heuristic be used in travelling salesman problem? [2]

Section - II

Que. – 4 [A] Explain resolution in propositional logic. [6]

[B] Discuss Expert System with suitable example. [6]

OR

Que. – 4 [A] Explain resolution in predicate logic. [6]

[B] Explain following terms: [6]

1. Semantic network
2. Frames

Que. – 5 [A] Consider the following sentences: [6]

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.

Answer the following:

a) Translate these sentences into formulas in predicate logic.

b) Prove that John likes peanuts using backward chaining.

c) Use resolution to answer the question, "What food does Sue ear?

[B] Prove: $(A \cap B) = (A^c \cup B^c)^c$ [5]

OR

Que. – 5 [A] Write the sequence of steps to convert predicate logic into clause form. [6]

Apply these steps on following predicate logic.

$\forall x$: [Roman(x) $\wedge$ know(x, Marcus)] $\rightarrow$ [hate(x, Caesar)] $\vee$ ($\forall y$: $\exists z$: hate(y, z) $\rightarrow$ thinkcrazy (x, y))]

[B] Explain tangled hierarchies with suitable example. [5]

Que. –6 [A] Explain minimax search procedure with suitable example. [5]

[B] Describe the terms dendrites, synapses, axon, nucleus, cell body in a biological neuron network. Establish analogy between these terms and components of artificial neural network. [5]

[C] Discuss Bayesian network in details. [2]

END OF PAPER