

Name :

Roll No. :

Invigilator's Signature :

CS / B.TECH (CSE) / SEP.SUPPLE / SEM-7 / CS-702 / 2012

2012

ARTIFICIAL INTELLIGENCE

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable*

GROUP – A

(Objective Type Questions)

1. Write brief answers for any *ten* of the following :

10 × 1 = 10

- i) What do you mean by AI ?
- ii) What is knowledge elicitation ?
- iii) What are the different languages supporting expert system ?
- iv) What are semantic nets ?
- v) What are facts ?
- vi) What is Rule based system architecture in expert system ?
- vii) List down the various methods of knowledge acquisition.
- viii) What is lisp ?
- ix) What is frame ?
- x) What do you mean by real time expert system ?
- xi) What is the role of an agent program ?
- xii) What is local maxima problem ?

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[Turn over

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GROUP – B**(Short Answer Type Questions)**Answer any *three* of the following. $3 \times 5 = 15$

2. What is Artificial Intelligence ? Explain how an AI system is different from a conventional computing system. $2 + 3$
3. Present an overview of knowledge representation methods. 5
4. Describe DFS with suitable example. 5
5. What is a production system ? Explain with an example. 5
6. Discuss the Water Jug problem as state space search. 5

GROUP – C**(Long Answer Type Questions)**Answer any *three* of the following. $3 \times 15 = 45$

7. a) When would best-first search be worse than simple breadth-first search ? 3
- b) Consider trying to solve the 8-puzzle using hill climbing. Can you find a heuristic function that makes this work ? 6

1	2	3
8	5	6
4	7	

START

GOAL		
1	2	3
4	5	6
7	8	

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- c) Describe hill climbing algorithm. What are the problems of hill climbing ? 4 + 2
8. a) What do you mean by partitioned semantic nets ? Explain by taking examples how frames are used for representing knowledge. 2 + 3
- b) What are the issues involved in relating an appropriate knowledge acquisition method ? 5
- c) What are the steps involved in forward chaining ? 5
9. a) Assume the facts :
- (i) Steve only likes easy courses
 - (ii) Science courses are hard.
 - (iii) All courses in the arts Department are easy.
 - (iv) TL 301 is an arts department course.
- Use resolution to answer the question which course would Steve like ? 8
- b) How are Bayes' rule used to combine evidence in simple case ? 7
10. a) How do we represent simple facts in logic ? 5
- b) Consider the following set of propositions :
- (i) Patient has spots
 - (ii) Patient has measles

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- (iii) Patient has high fever
- (iv) Patient has Rocky Mountain Spotted Fever
- (v) Patient has previously been inoculated against measles
- (vi) Patient was recently bitten by a tick
- (vii) Patient has an allergy

Make it a Bayesian network by constructing the necessary conditional probability matrix 5

- c) Consider the same proposition again and identify the patient's disease using Dempster-Shafer theory. 5

11. Write short notes on any *three* of the following : 3 × 5

- a) Learning
- b) Fuzzy
- c) Natural Language Processor
- d) Alpha-beta Cutoffs
- e) A* algorithm.

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