Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 51763

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2014.

Seventh Semester

Computer Science and Engineering

080230042 — ARTIFICIAL INTELLIGENCE

(Regulation 2008)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What do you mean by local maxima in search technique?

2. What are the components of problem definition?

3. State the advantages of simulated annealing.

4. Define: CSP.

5. Decide whether the following sentence is valid, unsatisfiable or neither :
   Fire => Smoke.

6. Represent the following sentence in first-order logic: Only one student took Greek in spring 2001.

7. Why do we never find two nodes denoting the same variable in the same branch of a decision tree?

8. Differentiate feed-forward and recurrent network structures.

9. Obtain a parse tree for "John loves Mary".

10. Define : metaphor.

PART B — (5 × 16 = 80 marks)

11. (a) Develop the characteristics (observable, deterministic, episodic, static, discrete) of task environments for

    (i)   Crossword Puzzle agent   (4)
    (ii) Taxi driving agent   (4)
    (iii) Medical diagnosis   (4)
    (iv) Interactive English Tutor.   (4)

Or

    (b) Does a finite state space always lead to a finite search tree? How about a finite state space that is a tree? Can you be more precise about what types of state spaces always lead to finite search frees?   (16)

12. (a) Prove that for every game tree, the utility obtained by MAX using minimax decisions against a suboptimal MIN will never be lower than the utility obtained playing against an optimal MIN. (16)

Or

(b) Describe a real-time multiplayer game-playing environment, where time is part of the environment state and players are given fixed time allocations. (16)

13. (a) Discuss the syntax and semantics of first order logics. (16)

Or

(b) Discuss in detail the architecture of utility-based learning agent, with a sample application. (16)

14. (a) (i) Explain in detail the back propagation algorithm in detail. (8)

(ii) Explain in detail the features of reinforcement learning. (8)

Or

(b) Explain in detail the following :

(i) Expressivity of the decision trees (4)

(ii) Inducing decision tress from examples (4)

(iii) Choosing attribute tests (4)

(iv) Performance measure of decision trees. (4)

15. (a) "Grammar induction is an obvious task to attempt, given that it has proven to be so difficult to construct a grammar by hand and that billions of example utterances are available for free on the Internet. It is a difficult task because the space of possible grammars is infinite and because verifying that a given grammar generates a set of sentences is computationally expensive". Discuss.

Or

(b) (i) Describe early image processing operations. (8)

(ii) Explain about object recognition. (8)

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