Roll No. [ ]

44

ANNA UNIVERSITY
B.E./B.TECH. DEGREE EXAMINATIONS, APRIL/MAY 2012.
COMPUTER SCIENCE AND ENGINEERING - R2008
V SEMESTER

CS9304 ARTIFICIAL INTELLIGENCE

Time: 3 Hrs Max.Marks: 100

PART - A (10 x 2 = 20)

1. State the significance of Turing Test.
2. Distinguish: Semantics and Pragmatics, with an example.
3. State the significance of A* search.
4. Define: Local maxima.
5. Decide whether the following sentence is valid, unsatisfiable or neither: $Smoke => Fire$
6. Represent the following sentence in first-order logic: $Every\ student\ who\ takes\ French\ passes\ it$
7. What is sampling with replacement?
8. Define: Regression.
9. Provide two examples each for noun phrase and verb phrase.
10. What is word sense disambiguation?

PART - B (5 x 16 = 80)

11. The hardest task environment is partially observable, stochastic, sequential, dynamic, continuous and multi agent. Why is it so? Justify the statement with a suitable example. (16)

12. (a) Prove the following:

    (i) Breadth-first search is a special case of uniform-cost search. (8)
    (ii) Uniform-cost search is a special case of A* search. (8)

    (or)

    (b)Prove that if a heuristic is consistent, it must be admissible. Construct an admissible heuristic that is not consistent. (16)

13. (a) (i) Represent the sentence "All Germans speak the same languages" in predicate calculus. (8)

    (ii) What axiom is needed to infer the fact $Female(Laura)$ given the facts $Male(Jim)$ and $Spouse(Jim, Laura)$? (8)

    (or)

(b)(i) Suppose a knowledge base contains just one sentence $\exists x\ AsHighAs(x, Everest)$. Which of the following are legitimate results of applying Existential Instantiation?

I. $AsHighAs(Everest, Everest)$. (4)

II. $AsHighAs(Kilimanjaro, Everest)$ (4)

(ii) For each pair of atomic sentences, give the most general unifier if it exists:

I. $Knows\ (Father(y), y), Knows(x, x)$. (4)

II. $Older(Father(y), y), Older(Father(x), John)$ (4)

14. (a) Draw and explain a decision tree for the problem of deciding whether to move forward at a road intersection, given that the light has just turned green. (16)

(or)

(b) Consider an arbitrary Bayesian network, a complete data set for that network, and the likelihood for the data set according to the network. Give a simple proof that the likelihood of the data cannot decrease if we add a new link to the network and recomputed the maximum likelihood parameter values. (16)

15. (a) Obtain a parse tree for "Every one has a belief in God except Aethists". (16)

(or)

(b) Write short notes on (i) Machine Intelligence (ii) Information Retrieval. (16)