

18/11/13

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B.E / B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, NOV / DEC 2013

COMPUTER SCIENCE AND ENGINEERING

12

V Semester

CS 9304 – Artificial Intelligence

(REGULATION 2008)

Time: 3 Hours

Answer ALL Questions

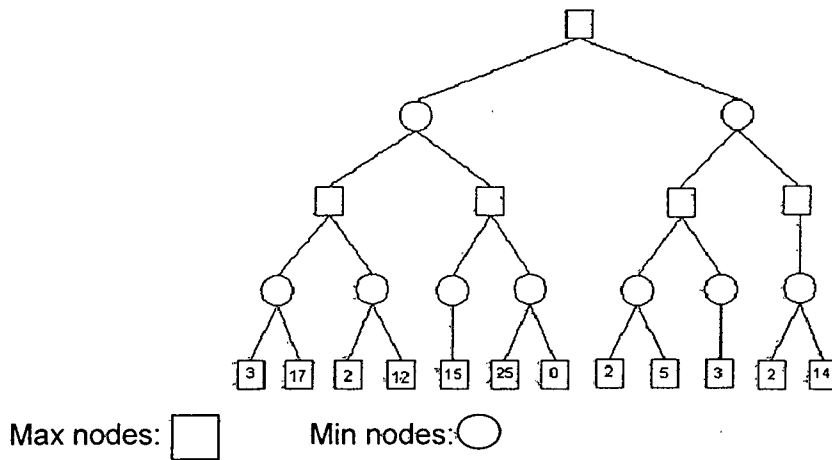
Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. Write the PEAS description of the task environment for Interactive English Tutor.
2. Name and define three distinct problem types due to the incomplete knowledge of states /actions in search.
3. When is the Heuristic function said to be admissible?
4. Compare Genetic algorithm and stochastic beam search
5. Define Satisfiability & Entailment
6. What are the functions used to interact with knowledge base?
7. Discuss various types of learning
8. State Ockham's razor principle
9. Differentiate Top down parsing and Bottom up parsing techniques
10. Define Kidnapping problem

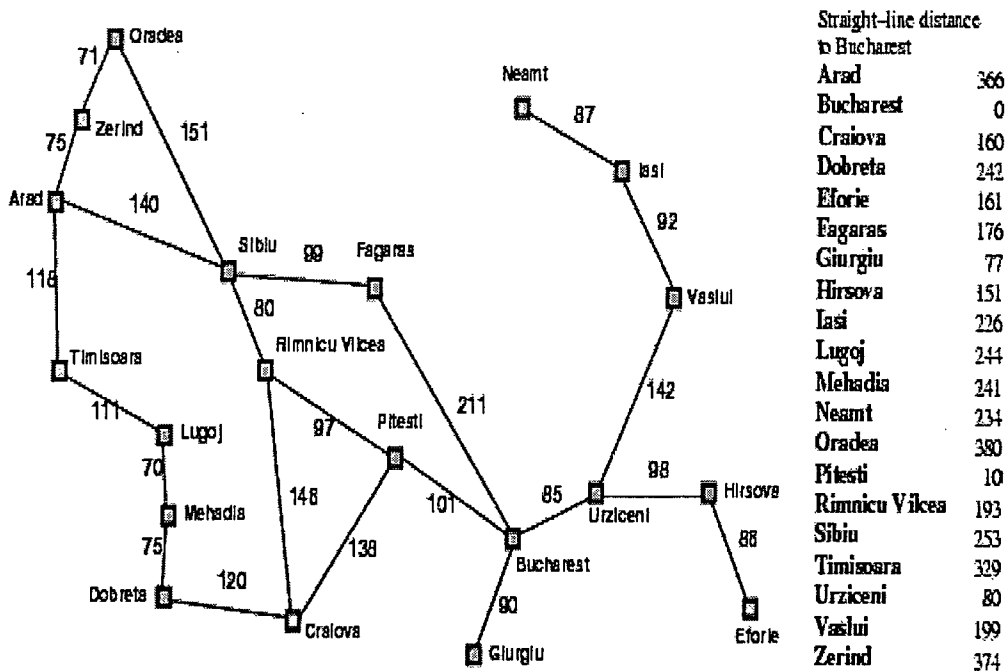
Part – B (5 x 16 = 80 marks)

11. (i) Give the initial state, goal test, successor function and cost function for the following:
"You have a program that outputs the message "illegal input record" when fed a certain file of input records. You know that processing of each record is independent of the other records. You want to discover what record is illegal" (6)
- (ii) What is the strategy used for node selection during expansion for the BFS and Iterative Deepening DFS techniques and compare the problem solving performance of both techniques with four measuring parameters (10)
12. (a) (i) Is forward checking detecting all inconsistencies in Constraint satisfaction problem? Justify your answer. If not, Brief about the stronger technique with examples for constraint propagation than forward checking. (8)
- (ii) Draw the complete game tree by marking each node with backed up minimax value and Explain the step-by-step process of alpha-beta pruning with pruned tree. (8)



(OR)

12. (b) (i) Explain the optimality of A* Search and RBFS by analyzing their performance for reaching Bucharest from Arad. (16)



13. (a) (i) Construct knowledge base for the following using FOL (10)

- Cats like fish
- Cats eat everything they like
- Josephine is a cat.

Use Forward chaining to prove the fact: Josephine eats fish

(ii) You go to see the doctor about an ingrowing toenail. The doctor selects you at random to have a blood test for swine flu, which for the purposes of this exercise we will say is currently suspected to affect 1 in 10,000 people in Australia. The test is 99% accurate, in the sense that the probability of a false positive is 1%. The probability of a false negative is zero. You test positive. What is the new probability that you have swine flu? (6)

(OR)

13. (b) (i) Consider Wumpus World example with (4,4) Grid. Using Resolution algorithm in Propositional logic, Infer the following fact : " There is a pit in [3,1]" (8)

1,4	2,4	3,4	4,4
1,3	2,3	3,3	4,3
1,2 OK	2,2 P?	3,2	4,2
1,1 V OK	2,1 A B OK	3,1 P?	4,1

- (ii) Convert the following English statements into First Order Logic: (8)
- (a) Every farmer who owns a donkey buys hay
 - (b) No Purple mushroom is poisonous
 - (c) Every boy or girl is a child
 - (d) Every child gets a doll or a train or a lump of coal

14. (a) (i) The following table consists of training data from an employee database. The data have been generalized. Let *status* be the class label attribute. Construct Decision tree from the given data. (16)

DEPT	AGE	SALARY	COUNT	STATUS
sales	31...35	46K...50K	30	senior
sales	26...30	26K...30K	40	junior
sales	31...35	31K...35K	40	junior
systems	21...25	46K...50K	20	junior
systems	31...35	66K...70K	5	senior
systems	26...30	46K...50K	3	junior
systems	41...45	66K...70K	3	senior
marketing	36...40	46K...50K	10	senior
marketing	31...35	41K...45K	4	junior
secretary	46...50	36K...40K	4	senior
secretary	26...30	26K...30K	6	junior

(OR)

- (b) Explain in detail about Active and Passive Reinforcement learning (16)

15. (a) (i) Brief about the Edge detection process and Image segmentation (10)
(ii) Explain the Robot motion planning algorithms to handle uncertain movements (6)

(OR)

15. (b) (i) Explain the following Robot path planning techniques (10)
(a) Cell decomposition
(b) Skeletonization
(ii) Discuss the Lexical, syntactical and semantical Ambiguity (6)