

Printed Page:-

Subject Code:- AEC0616

Roll. No:

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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: VI - THEORY EXAMINATION (20..... - 20.....)

Subject: Artificial Intelligence

Time: 3 Hours

Max. Marks: 100

General Instructions:

IMP: Verify that you have received the question paper with the correct course, code, branch etc.

1. This Question paper comprises of three Sections -A, B, & C. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.

2. Maximum marks for each question are indicated on right -hand side of each question.

3. Illustrate your answers with neat sketches wherever necessary.

4. Assume suitable data if necessary.

5. Preferably, write the answers in sequential order.

6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION-A

20

1. Attempt all parts:-

- 1-a. Which computer system beat Grandmaster Gary Kasparov in a chess game in 1997? (CO1, K1) 1
- (a) Shakey
(b) Deep Thought
(c) Deep Blue
(d) STRIPS
- 1-b. _____ was the first test to proposed to evaluate Artificial Intelligence. (CO1, K1) 1
- (a) IQ Test
(b) Theorem proving
(c) Loebner Prize
(d) Turing Test
- 1-c. Blind search is also known as (CO2, K1) 1
- (a) Informed Search
(b) Uninformed search
(c) Heuristic search
(d) Goal Search
- 1-d. A node with no children in the tree is known as (CO2, K1) 1
- (a) Decision Node
(b) Root Node

- (c) Terminal Node
- (d) Parent Node
- 1-e. _____ propositional logic operator has highest preferences. (CO3, K2) 1
- (a) $\wedge$
- (b) $\vee$
- (c) $\neg$
- (d) $\Rightarrow$
- 1-f. Artificial intelligence uses _____ logical connectives.(CO3, K1) 1
- (a) Two
- (b) Three
- (c) Four
- (d) Five
- 1-g. Knowledge-based agent are composed of (CO4, K1) 1
- (a) Knowledge-base and environment
- (b) Knowledge-base and inference system
- (c) Inference system only
- (d) all of the mentioned
- 1-h. Suppose an automated taxi agent needs to go from a station A to station B, and he knows the way from A to B, so this comes at (CO4, K2) 1
- (a) knowledge level
- (b) logical level
- (c) Implementation level
- (d) None of the mentioned
- 1-i. What is the other name for forward state-space search? (CO5, K1) 1
- (a) Progression planning
- (b) Regression planning
- (c) Test planning
- (d) None of the mentioned
- 1-j. In ant colony optimization, the pheromone trail left by an ant is: (CO5, K1) 1
- (a) a measure of the quality of a solution
- (b) a representation of the ant's fitness
- (c) a way of communicating with other ants
- (d) none of the above
2. Attempt all parts:-
- 2.a. Define Artificial intelligence. (CO1, K1) 2
- 2.b. Define Pruning in a search tree. (CO2, K1) 2
- 2.c. Define Propositional logic in AI. (CO3, K1) 2

- 2.d. Draw the architecture of knowledge based system. (CO4, K1) 2
- 2.e. Define Bayesian theory. (CO5, K1) 2

SECTION-B

30

3. Answer any five of the following:-

- 3-a. Write the PEAS description of Taxi driving. (CO1, K3) 6
- 3-b. Define the following terms: Environment, Sensor and actuator. (CO1, K1) 6
- 3-c. Describe Hill climbing algorithm. (CO2, K2) 6
- 3-d. Explain Adversarial search in AI. (CO2, K2) 6
- 3.e. Distinguish between Propositional logic and First-Order logic with example. (CO3, K3) 6
- 3.f. Explain Forward chaining and its properties. (CO4, K2) 6
- 3.g. What is the difference between supervised and unsupervised learning? (CO5, K2) 6

SECTION-C

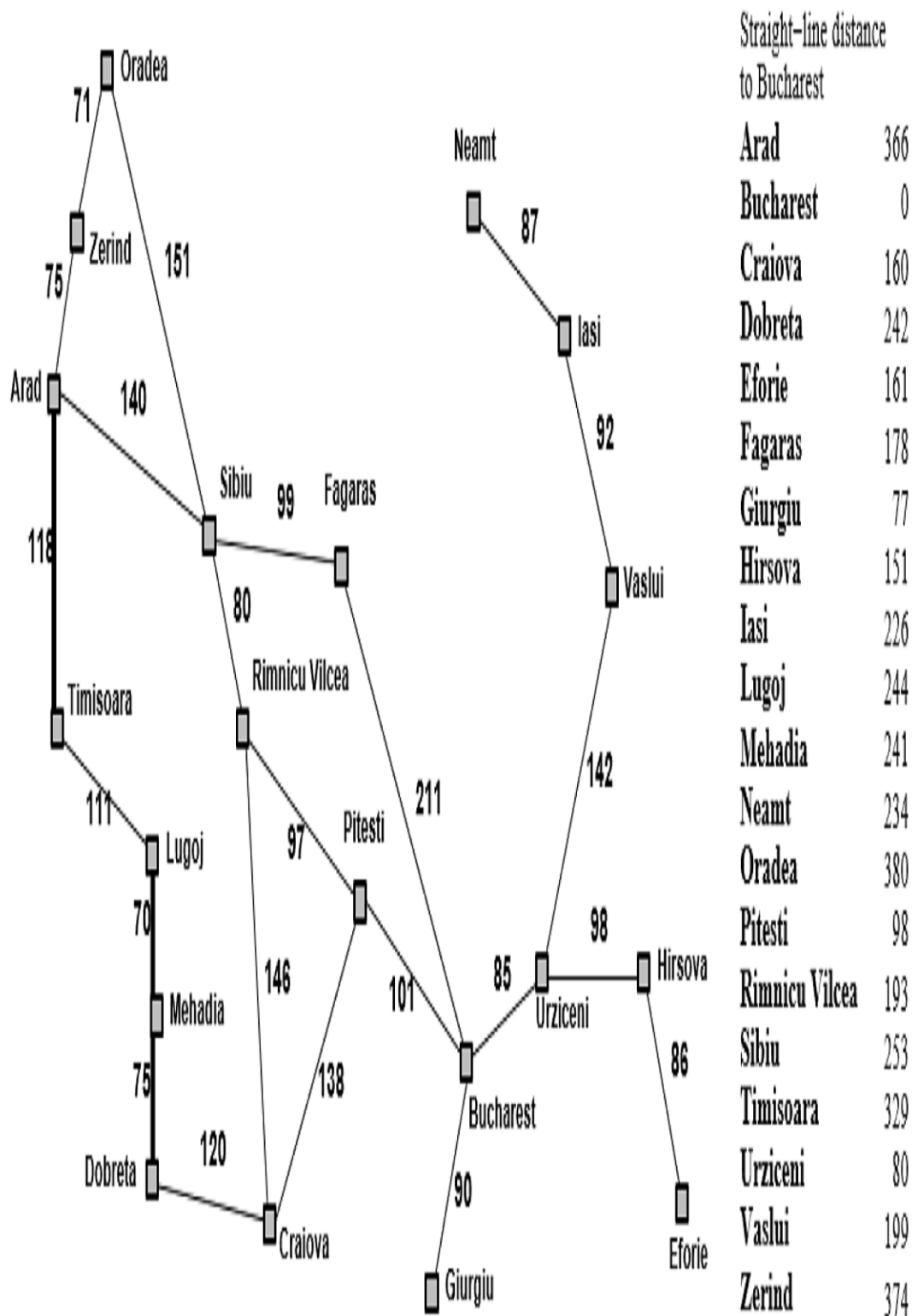
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4. Answer any one of the following:-

- 4-a. Explain the historical development of Artificial Intelligence. (CO1, K1) 10
- 4-b. Give a complete problem formulation for each of the following. Choose a formulation that is precise enough to be implemented. (a). Using only four colours, you have to colour a planar map in such a way that no two adjacent regions have the same colour. (b). A 3-foot-tall monkey is in a room where some bananas are suspended from the 8-foot ceiling. The monkey would like to get the bananas. The room contains two stackable, movable, climbable 3-foot-high crates. (CO1, K3) 10

5. Answer any one of the following:-

- 5-a. Find the path from Arad to Bucharest by using Greedy Search and A* search. (CO2, K3) 10



- 5-b. Differentiate between best first, greedy best first and A* algorithm. (CO2, K4) 10
6. Answer any one of the following:-
- 6-a. Three missionaries and three cannibals are on one side of a river, along with a boat that can hold one or two people. Find a way to get everyone to the other side without ever leaving a group of missionaries in one place outnumbered by the cannibals in that place. a.) Formulate the problem precisely, making only those 10

distinctions necessary to ensure a valid solution. Draw a diagram of the complete state space. b.) Implement and solve the problem optimally using an appropriate search algorithm. (CO3, K3)

- 6-b. Express the following English statement in the language of Propositional Logic: 10
a.) It rains in July b.) The book is not costly c.) If it rains today and one does not carry Umbrella, he will be drenched d.) If it rains today and Aditya Ranjan does not carry Umbrella, he will be drenched e.) He plays Cricket. (CO3, K3)
7. Answer any one of the following:-
- 7-a. What is an expert system in AI, and how does it work? Explain in detail. (CO4, K2) 10
- 7-b. What is rule based systems? Explain with an example. (CO4, K2) 10
8. Answer any one of the following:-
- 8-a. Draw the structure of a decision tree and explain the working with an example. (CO5, K2) 10
- 8-b. Explain the working principles of ant colony optimization in detail. (CO5, K3) 10

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