Printed Page:- 04 **Subject Code:- AEC0616**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: VI - THEORY EXAMINATION (2023 - 2024)

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. ____is the complete history of everything the agent has ever perceived.(CO1) 1

(a) Goal

(b) State-space

(c) Percept

(d) Percept sequence

1-b. In1972, the first intelligent humanoid robot was built in Japan which was named as (CO1) 1

(a) SNARC

(b) DEEP BLUE

(c) WABOT 1

(d) ELIZA

1-c. _____ is the example of Uninformed search algorithm. (CO2) 1

(a) Greedy Best first Search

(b) A* Search

(c) Depth first search

(d) None of the above

1-d. The data structure node PATH-COST in the tree represents(CO2) 1

(a) the state to which the node corresponds

(b) the node in the tree that generated this node

(c) the action that was applied to the parent's state to generate this node

(d) the total cost of the path from the initial state to this node

1-e. Artificial intelligence uses _____ logical connectives.(CO3) 1

(a) Two

(b) Three

(c) Four

(d) Five

1-f. If A is True and B is false, then A ⇔ B is (CO3) 1

(a) TRUE

(b) FALSE

(c) Either True or false

(d) Neither true nor false

1-g. Operation performed by KBA are (CO4) 1

(a) Tell and Ask

(b) Ask and Perform

(c) Tell, Ask and Perform

(d) None of the mentioned

1-h. Forward Chaining is a (CO4) 1

(a) Top -down Approach

(b) Bottom-up Approach

(c) both of the above

(d) None of the mentioned

1-i. The root node of a decision tree represents: (CO5) 1

(a) a leaf node

(b) a decision rule

(c) a split on a feature

(d) none of the above

1-j. In a goal-based agent, the agent selects actions that (CO5) 1

(a) maximize its utility function

(b) minimize its cost function

(c) achieve a desired goal

(d) all of the above

2. Attempt all parts:-

2.a.	Enlist the capabilities of a machine to pass the Turing test. (CO1)	2
2.b.	Define Goal in AI. (CO2)	2
2.c.	Briefly describe Heuristic knowledge. (CO3)	2
2.d.	Define resolution and write the steps for resolution. (CO4)	2
2.e.	Describe neural network learning. (CO5)	2

SECTION B **30**

3. Answer any <u>five</u> of the following:-

3-a.	Explain Goal based Agent with suitable example. (CO1)	6
3-b.	Differentiate between Strong AI and Weak AI.(CO1)	6
3-c.	Explain the different parameters for evaluating the performance of Search strategies. (CO2)	6
3-d.	Explain Adversarial search in AI. (CO2)	6
3.e.	Write a short note on Semantic Tableaux and resolution in FOPL. (CO3)	6
3.f.	Draw the architecture of knowledge based system and define each block. (CO4)	6
3.g.	Define planning and explain different types of planning in AI. (CO5)	6

SECTION C **50**

4. Answer any <u>one</u> of the following:-

4-a.	Write down the features of Well-defined learning problem and also write the features of well posed learning problem of the following: (a) A checkers learning problem (b) A handwriting recognition learning problem (c) A robot driving learning problem. (CO1)	10
4-b.	Explain the historical development of Artificial Intelligence. (CO1)	10

5. Answer any <u>one</u> of the following:-

5-a.	Distinguish between Greedy Best-first Search and A* Search algorithm. (CO2)	10
5-b.	Explain Mini-Max search with reference to game playing. (CO2)	10

6. Answer any <u>one</u> 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	10

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 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)

6-b. Draw truth table for the five logical connectives in Propositional logic and explain its importance. (CO3) 10

7. Answer any <u>one</u> of the following:-

7-a. Write short note on (i) Operations performed by KBA (ii) Levels of KBA (iii) Approaches to design a KBA. (CO4) 10

7-b. Draw the architecture of an expert system and explain it in detail. (CO4) 10

8. Answer any <u>one</u> of the following:-

8-a. Explain Particle swarm optimization algorithm. (CO5) 10

8-b. Write short note on (i) supervised learning (ii) Unsupervised learning. (CO5) 10