Printed Page:- 03 **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. The Turing test considers which of the following trait as evidence of machine intelligence. (CO1) 1

(a) Acting humanly

(b) Thinking humanly

(c) Acting rationally

(d) Thinking rationally

1-b. ENIAC stands for _____. (CO1) 1

(a) Electronics number inferences and coding

(b) Electrical numerical integrator and computers

(c) Electronic numerical integrator and computers

(d) Electronics numerical integrator and computation

1-c. Depth first search uses ____Queue. (CO2) 1

(a) FIFO

(b) LIFO

(c) HIFO

(d) FILO

1-d. In AI, DFS Stands for (CO2) 1

(a) Die first stack

(b) Dead first search

(c) Depth first search

(d) Depth for search

1-e. The structure of sentences is known as_____. (CO3) 1

(a) Inference

(b) Logic

(c) Syntax

(d) Semantics

1-f. Pick up the false statement for propositional Logic. (CO3) 1

(a) Each sentence is a declarative sentence

(b) Propositional logic is a knowledge representation technique in AI

(c) The sentences of Propositional logic can have answers other than True or False

(d) None of these

1-g. 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-h. Inference in an expert system is (CO4) 1

(a) The process of applying rules and knowledge to solve a problem or make a decision.

(b) The process of collecting data and training a model to recognize patterns.

(c) The process of optimizing a set of parameters using a gradient descent algorithm.

(d) The process of evaluating different options and selecting the best one based on a set of criteria.

1-i. Conditional planning is a technique used to: (CO5) 1

(a) plan a sequence of actions based on a set of conditions

(b) make decisions based on probabilities

(c) learn from experience

(d) none of the above

1-j. _____is not a form of learning in AI. (CO5) 1

(a) Supervised learning

(b) Reinforcement learning

(c) Unsupervised learning

(d) Expert learning

2. Attempt all parts:-

2.a. Define the Reflex agent. (CO1) 2

2.b. Define Parent Node and Child Node in a search tree. (CO2) 2

2.c. Enlist the different ways of knowledge representation in AI. (CO3) 2

2.d. Define Horn Clause logic. (CO4) 2

2.e.	Briefly explain how does decision tree learning work. (CO5)	2

SECTION-B 30

3. Answer any five of the following:-

3-a.	Explain the features of Well-defined learning problem with example.(CO1)	6
3-b.	Describe AI, Deep learning and Machine learning and its relation with block diagram. (CO1)	6
3-c.	Describe Alpha-Beta Pruning in AI. (CO2)	6
3-d.	Explain Zero-Sum Game. (CO2)	6
3.e.	Briefly explain Logic Programming in Prolog. (CO3)	6
3.f.	Define probabilistic reasoning and explain the need of probabilistic reasoning in AI. (CO4)	6
3.g.	Write short note on (i) Conditional Planning (ii) Continuous Planning (iii) Multi-agent Planning. (CO5)	6

SECTION-C 50

4. Answer any one of the following:-

4-a.	Define intelligence and explain the different approaches in defining artificial intelligence. (CO1)	10
4-b.	Write the PEAS description of the following agent types: (i) a medical diagnosis system (ii) Satellite image analysis system (iii) Part-picking robot. (CO1)	10

5. Answer any one of the following:-

5-a.	Explain Breadth First Search and Depth First Search with example and also write its advantages & disadvantages. (CO2)	10
5-b.	Differentiate between simulated annealing and hill climbing. (CO2)	10

6. Answer any one of the following:-

6-a.	Express the following English statement in the language of Propositional Logic: 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)	10
6-b.	Write Pros and cons of propositional logic and explain First-order logic. (CO3)	10

7. Answer any one of the following:-

7-a.	Compare forward chaining and backward chaining in detail. (CO4)	10
7-b.	Write short note on (i) knowledge Based System (ii) Rule Based System (iii) Frame Based System. (CO4)	10

8. Answer any one of the following:-

8-a.	Explain the working principles of ant colony optimization in detail. (CO5)	10
8-b.	Write short note on (i) Semi- supervised learning (ii) Reinforcement learning. (CO5)	10