Printed Page:- 05 **Subject Code**:- **ACSAI0401**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM:IV CARRY OVER THEORY EXAMINATION - AUGUST 2023

Subject: Introduction to 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. What are the different types of Artificial approaches? (CO1) 1

(a) Strong approach

(b) Weak approach

(c) Applied approach

(d) All of the above

1-b. Agent function is..... (CO1) 1

(a) f:P* → A

(b) f:P& → A

(c) f:P# → A

(d) f:P@ → A

1-c. The search strategy the uses a problem specific knowledge is known as _____. (CO2) 1

(a) Uninformed search

(b) Informed search

(c) Depth-first search

(d) None of the mentioned

1-d. The search strategy the uses a problem specific knowledge is known as _____. (CO2) 1

(a) Uninformed search

(b) Informed search

(c) Depth-first search

(d) None of the mentioned

1-e. What among the following could the universal instantiation of : For all x King(x) ^ Greedy(x) => Evil(x) (CO3) 1

(a) King(John) ^ Greedy(John) => Evil(John)

(b) King(y) ^ Greedy(y) => Evil(y)

(c) King(Richard) ^ Greedy(Richard) => Evil(Richard)

(d) All of the mentioned

1-f. Which search strategy is also called as blind search? (CO3) 1

(a) Uninformed search

(b) Informed search

(c) Simple reflex search

(d) All of the mentioned

1-g. Which of the following is not a Capabilities of Expert Systems? (CO4) 1

(a) Advising

(b) Demonstrating

(c) Explaining

(d) Expanding

1-h. ___ is the ability to direct the inferential mechanisms into the most productive directions by storing appropriate guides. (CO4) 1

(a) Acquisition Efficiency

(b) Inferential Efficiency

(c) Inferential Adequacy

(d) None of the above

1-i. Which of the following is an application of reinforcement learning? (CO5) 1

(a) Topic Modeling

(b) Recommendation System

(c) Pattern Recognition

(d) Image Classification

1-j. Decision tree is the most powerful for ..... (CO5) 1

(a) Classification

(b) Prediction

(c) Both A and B

(d) None of these

2. Attempt all parts:-

2.a. Differentiate between supervised and unsupervised Learning? (CO1) 2

2.b. what do you understand by utility? (CO2) 2

2.c. Define MAX and MIN in min max algorithm. Give name of one application in which it used? (CO3) 2

2.d. Draw truth Table for following proposition: $P \rightarrow (Q \rightarrow R) \rightarrow S$ (CO4) 2

2.e. Explain Reasoning under uncertainity. (CO5) 2

SECTION B **30**

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

3-a. Give four example of where AI is used on a daily basis. (CO1) 6

3-b. What do you mean by Artificial Intelligence? Define its goals. (CO1) 6

3-c. Explain the prolems associated with Hill climbing? (CO2) 6

3-d. Breadth First Search guarantees the solution, if it exists. Comment on the statement. (CO2) 6

3.e. Explain semantic network, partitioned network, frames with its advantages and disadvantages? (CO3) 6

3.f. Find the resolvent of the following sets: i.) {PVQ, ~PV~Q}, ii.) {PV~Q, QVRVS} iii.) {PV~Q}, PVQ, ~P (CO4) 6

3.g. Discuss Learning Classification in detail. (CO5) 6

SECTION C **50**

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

4-a. Describe Minimax algorithm for TIC TAC TOE problem and also write properties of minimax algorithm fir TIC TAC TOE problem? (CO1) 10

4-b. Suppose you design a machine to pass the Turning Test. What are capabilities machine must have? (CO1) 10

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

5-a.	Explain the working of Minimax Algorithm with example. Also, write its properties. (CO2)	10
5-b.	Explain Adversarial Search with an example and algorithm. Write its advantages and disadvantages also. (CO2)	10

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

6-a.	Consider the facts below and find answer to the question: "Was Marcus loyal to Caesar" (CO3) 1. Marcus was a man. 2. Marcus was a Pompeian. 3. All Pompeians were Romans. 4. Caesar was a ruler. 5. All Romans were either loyal to Caesar or hated him. 6. Everyone is loyal to someone. 7. People only try to assassinate rulers they are not loyal to. 8. Marcus tried to assassinate Caesar. 9. All men are people.	10
6-b.	Determine using Tableaux method, whether the following sets of expressions are mutually consistent or not:- (CO3) P->Q, Q->R, R->S, P->S, RV~S	10

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

7-a.	Determine using resolution by refutation method, whether the following argument is valid or not:- (CO4) • If John lives in England, then he lives in UK. • John does not live in UK. • Therefore John does not live in England.	10
7-b.	Explain Forward Chaining and Backward Chaining with diagram. (CO4)	10

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

8-a.	Define Evolutionary algorithm.What are the advantages and disadvantages of Evolutionary algorithm? Explain some application of it. (CO5)	10
8-b.	What is an expert system shell? How is it used to develop an expert system?	10

Provide an example of a real-world application where an expert system shell is used. (CO5)