Printed Page:-04 NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA (An Autonomous Institute Affiliated to AKTU, Lucknow) **B.Tech**

SEM: III - THEORY EXAMINATION (2024-2025)

Roll. No:

Subject Code:- ACSAI0301

Subject: Introduction to Artificial Intelligence

Time: 3 Hours

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. EC-2024

SECTION-A

1. Attempt all parts:-

1-a. _____ is known as father of AI. (CO1,k1)

- Fisher Ada (a)
- Alan Turing (b)
- (c) John McCarthy
- (d) Allen Newell

This rule is applied for the Simple reflex agent. (CO1,k1) 1-b.

- Simple-action rule (a)
- Simple & Condition-action rule (b)
- Condition-action rule (c)
- None of the above (d)

Heuristic function of greedy best-first search denoted as _____. (CO2,k1) 1-c. 1

f(n) != h(n)(a)

- f(n) < h(n)(b)
- (c) f(n) = h(n)
- (d) f(n) > h(n)
- Breadth-first search always expands the _____ node in the current fringe of the 1-d. 1 search tree.(CO2,K1)
 - (a) Deepest
 - Child node (b)

Max. Marks: 100

1

20

1

- (c) Shallowest (d) Minimum cost Semantic Network represents _____(CO3,K1) 1 1-e. (a) Syntactic relation between concepts (b) Semantic relations between concepts (c) All of the mentioned None of the mentioned (d) transposition rule is - (CO3,K1) 1 1-f. From $p \rightarrow q$, infer $\sim q \rightarrow p$ (a) From $p \rightarrow q$, infer $q \rightarrow \sim p$ (b) From $p \rightarrow q$, infer $q \rightarrow p$ (c) From $p \rightarrow q$, infer $\sim q \rightarrow \sim p$ (d) Knowledge and reasoning also play a crucial role in dealing with 1 1-g. _ environment.(CO4,K1) Completely Observable (a) Partially Observable (b) (c) Neither Completely nor Partially Observable Only Completely and Partially Observable (d) The Bayesian network graph does not contain any cyclic graph. Hence, it is known 1-h. 1 as a (CO4,K1) FC (a) DCG (b) DAG (c) CAG (d) SAG The process by which the brain orders actions needed to complete a specific task 1-i. 1 is referred as (CO5,K1) Planning problem (a) Partial order planning (b) (c) Total order planning Both Planning problem & Partial order planning (d) To eliminate the inaccuracy problem in planning problem or partial order planning 1-j. 1 problem we can use (CO5,K1)
 - (a) Stacks
 - (b) Queues
 - (c) BST
 - (d) Planning graphs
- 2. Attempt all parts:-
- 2.a. Explain Chatbot.(CO1,K1)

2.b.	Describe problem reduction.(CO2,K2)	2
2.c.	Find the truth table for $(P \rightarrow Q) \rightarrow ((P \rightarrow \sim Q) \rightarrow \sim P).(CO3,K2)$	2
2.d.	Define Probabilistic Reasoning.(CO4,K1)	2
2.e.	Explain Reasoning under uncertainty.(CO5,K2)	2
SECTIO	DN-B	30
3. Answe	er any <u>five</u> of the following:-	
3-а.	Define Artificial Intelligence (AI) and explain its main objectives.(CO1,K2)	6
3-b.	Explain the concept of a well-defined or well-posed learning system with an appropriate example.(CO1,K2)	6
3-c.	Discuss Uninformed Search Strategies. Explain the DFS algorithm with example.(CO2,k3)	6
3-d.	Explain Iterative Deepening and Heuristic Search with example. (CO2, K3)	6
3.e.	If it is hot, then it is humid. If it is humid, then it will rain. It is hot." Show that "It will rain" using Semantic Tableaux method in Propositional Logic.(CO3,K3)	6
3.f.	Explain Data driven and Goal driven approach in Expert System with an example of each. (CO4,K3)	6
3.g.	Explain the difference between supervised and unsupervised machine learning (CO5,K3)	6
SECTIO	<u>DN-C</u>	50
4. Answer any <u>one</u> of the following:-		
4-a.	Discuss the key characteristics of an AI problem with a suitable example.(CO1,K3)	10
4-b.	Explain Constraint Satisfaction in AI with a suitable example.(CO1,K3)	10
5. Answe	er any <u>one</u> of the following:-	
5-a.	Explain Production Systems and the Role of Rules in Solving AI Problems with suitable examples.(CO2,k3)	10
5-b.	Explain the Minimax Algorithm in detail, including its working principle, steps, and an example to illustrate its application. (CO2,k3)	10
6. Answe	er any <u>one</u> of the following:-	
6-a.	Explain the Travelling Salesman Problem (TSP) in detail. Discuss its significance, the challenges involved, and the commonly used algorithms to solve it.(CO3,K4)	10
6-b.	Discuss the different methods of Knowledge Representation in Artificial Intelligence, providing a suitable example for each method.(CO3,k3)	10
7. Answe	er any <u>one</u> of the following:-	
7-a.	Define the concept of an intelligent agent and explain its key components. Discuss the role of the environment in an agent's decision-making process. How does the environment influence the agent's actions, and what factors should be considered by the agent when interacting with its environment? Provide examples to illustrate	10

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your points. (CO4,K3)

- 7-b. Define probabilistic reasoning and explain its importance in AI. Discuss how it 10 helps in decision-making in uncertain environments. Provide examples where probabilistic reasoning is essential.(CO4,K4)
- 8. Answer any one of the following:-
- 8-a. Explain Conditional Planning and Continuous Planning in Artificial Intelligence. 10 Discuss their key differences, working mechanisms, and provide examples for each.(CO5,K4)
- 8-b. Explain Neural Network Learning and Genetic Learning in Artificial Intelligence. 10 Discuss their principles, differences, and provide examples to illustrate each.(CO5,K4)

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