Printed Page:- Subject Code:- ACSAI0513

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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech.

SEM: V - THEORY EXAMINATION (2022 - 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. The characteristics of the computer system capable of thinking, reasoning and learning is known is (CO1) 1

(a) machine intelligence

(b) human intelligence

(c) artificial intelligence

(d) virtual intelligence

1-b. The core components of learning system are……(CO1) 1

(a) The class of Tasks

(b) Measure of performance

(c) Source of Experience

(d) All of the above

1-c. The Set of actions for a problem in a state space is formulated by a _____ (CO2) 1

(a) Intermediate states

(b) Initial state

(c) Successor function, which takes current action and returns next immediate state

(d) None of the mentioned

1-d. Depth-first search always expands the _____ node in the current fringe of the search tree. (CO2) 1

(a) Shallowest

(b) Child node

(c) Deepest

(d) Minimum cost

1-e. . How many proposition symbols are there in artificial intelligence? (CO3) 1

(a) 1

(b) 2

(c) 3

(d) 4

1-f. Translate the following statement into FOL. “For every a, if a is a philosopher, then a is a scholar” (CO3) 1

(a) ∀ a philosopher(a) -> scholar(a)

(b) ∃ a philosopher(a) -> scholar(a)

(c) All of the mentioned

(d) None of the mentioned

1-g. Backward chaining rule is?(CO4) 1

(a) Goal driven

(b) Data driven

(c) Both A and B

(d) None of these

1-h. ….. condition is used to cease the growth of forward chaining.(CO4) 1

(a) Atomic sentences

(b) Complex sentences

(c) No further inference

(d) All of the mentioned

1-i. A ___ is a collection of attributes or slots and associated values that describe some real-world entity. (CO5) 1

(a) Frame

(b) Semantic networks

(c) Partitioned Semantic Networks

(d) None of the above

1-j. Choose the correct option regarding machine learning (ML) and artificial Intelligence (CO5) 1

(a) ML is a set of techniques that turns a dataset into a software

(b) AI is a software that can emulate the human mind

(c) ML is an alternate way of programming intelligent machines

(d) All of the above

2. Attempt all parts:-

2.a. How does Artificial Intelligence effects human life? Define the main threats because of AI? (CO1) 2

2.b. Differentiate Informed & Uninformed search. Give examples. (CO2) 2

2.c. Define the term logic. Explain its types also. (CO3) 2

2.d. Why you need a knowledge base? Write benefits of a knowledge base.(CO4) 2

2.e. Explain Planning in Artificial Intelligence? (CO5) 2

SECTION B 30

3. Answer any five of the following:-

3-a. Explain the different steps to design a well- defined Learning System in detail. (CO1) 6

3-b. How is Machine Learning related to Artificial Intelligence? (CO1) 6

3-c. Explain the Minimax search with sutaible example.(CO2) 6

3-d. Explain difference between Greedy Best First Search and Uniform Cost search. (CO2) 6

3.e. Explain First-Order Logic in Artificial intelligence with example.(CO3) 6

3.f. Explain Forward Chaining and Backward Chaining with diagram.(CO4) 6

3.g. Define the Bayesian Network in detail with example. (CO5) 6

SECTION C 50

4. Answer any one of the following:-

4-a. Explain the Problem Reduction in AI with example.(CO1) 10

4-b. Explain Constraint satisfaction and hence find the solution to following problem: (CO1) 10

SEND + MORE = MONEY

5. Answer any one of the following:-

5-a. Compare between Iterative deepening Heuristic Search & A*. Which one is better, explain 10

with suitable example. (CO2)

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| 5-b. | "Alpha-Beta Pruning algorithm is better then Minimax" Justify this statement with example.(CO2) | 10 |

6. Answer any one of the following:-

| | | |
|---|---|---|
| 6-a. | John or Mary or both will go to cinema. If John goes then Jenny will go. Mike will go if Mary goes. Mike does not go to cinema. Conclude that Jenny will go to cinema. (CO3) | 10 |
| 6-b. | Explain Missionaries Cannibals problem in detail.(CO3) | 10 |

7. Answer any one of the following:-

| | | |
|---|---|---|
| 7-a. | Describe Architecture of Expert System in detail.(CO4) | 10 |
| 7-b. | What do you mean by Markov Chains? Explain the areas where HMM is used. (CO4) | 10 |

8. Answer any one of the following:-

| | | |
|---|---|---|
| 8 | Explain various types of Uncertainty in Artificial Intelligence. (CO5) | 10 |
| 8 | Explain intelligent agents and their uses in artificial intelligence. (CO5) | 10 |