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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 (2024 - 2025)

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. Who is known as the "father" of artificial intelligence? (CO1,K1)

1

(a) Fisher Ada

(b) John McCarthy

(c) Allen Newell

(d) Alan Turning

1-b. The core components of learning system are.....(CO1, K1)

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, K1)

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. Which search method will expand the node that is closest to the goal? (CO2, K1)

1

(a) Best-first search

(b) Greedy best-first search

- (c) A* search
- (d) None of the mentioned
- 1-e. The main function of problem-solving agent is to(CO3, K1) 1
- (a) Solve the given problem and reach the goal
- (b) Find out which sequence of action will get it to the goal state.
- (c) Both a and b
- (d) None of the above
- 1-f. The main tasks of an AI agent are(CO3,K1) 1
- (a) Input and Output
- (b) Moment and Humanly Actions
- (c) Perceiving, thinking, and acting on the environment
- (d) None of the above
- 1-g. Rule based system also known as (CO4, K1) 1
- (a) Knowledge based system
- (b) Mycin based system
- (c) Human based system
- (d) None of the above
- 1-h. ___ is the ability to acquire new knowledge using automatic methods wherever possible rather than reliance on human intervention.(CO4, K1) 1
- (a) Acquisition Efficiency
- (b) Data driven
- (c) Inferential adequacy
- (d) Inferential Efficiency
- 1-i. Bayesian Belief Network is also known as ?(CO5, K1) 1
- (a) Belief network
- (b) Decision network
- (c) Bayesian model
- (d) All of the above
- 1-j. Choose the correct option regarding machine learning (ML) and artificial Intelligence (CO5, K1) 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 these

2. Attempt all parts:-

- 2.a. Define the main threats because of AI. (CO1, K2) 2
- 2.b. Differentiate between Informed and Uninformed Search. (CO2, K3) 2
- 2.c. Define tautology with suitable example. (CO3, K3) 2

- 2.d. Mention Some Popular Domains of AI.(CO4, K2) 2
- 2.e. Define reinforcement Learning. (CO5, K2) 2

SECTION-B

30

3. Answer any five of the following:-

- 3-a. Explain the different types of Artificial Intelligence. (CO1, K2) 6
- 3-b. Give some advantages and disadvantages of Artificial Intelligence?(CO1, K2) 6
- 3-c. Explain and differentiate between Blind Search and Heuristic Search using suitable examples. (CO2,K2) 6
- 3-d. Explain the Minimax search procedure with suitable example.(CO2, K2) 6
- 3.e. Explain the Semantic Tableaux and Resolution in Propositional logic. (CO3,K2) 6
- 3.f. Do you agree the development of Artificial Intelligence had some negative effect on the society? If you agree list some of them and put your opinion in the support of development of Artificial Intelligence.(CO4, K4) 6
- 3.g. Differentiate among inductive, deductive, and abductive learning? (CO5, K3) 6

SECTION-C

50

4. Answer any one of the following:-

- 4-a. Define intelligent agent in AI. Explain various types of agent program with suitable example.(CO1,K2) 10
- 4-b. Define Problem Reduction in AI? Explain AND OR Graphs with suitable example.(CO1,K2) 10

5. Answer any one of the following:-

- 5-a. Explain the problems associated with Hill Climbing and the ways to resolve those problems. (CO2,K3) 10
- 5-b. Take a suitable example and explain the step by step procedure of Alpha Beta Pruning in Adversarial Search. (CO2,K3) 10

6. Answer any one of the following:-

- 6-a. Explain different types of Knowledge Representation schemes using suitable examples and diagrams.(CO3,K3) 10
- 6-b. Explain Water Jug Problem in detail with its state space representation and Production rules. (CO3,K3) 10

7. Answer any one of the following:-

- 7-a. Describe the role of Inference Engine in an Expert System, also explain Forward and Backward Chaining with an example of each. (CO4,K3) 10
- 7-b. Define Markov Chains? Explain the areas where Hidden Markov model (HMM) is used. (CO4,K3) 10

8. Answer any one of the following:-

- 8-a. Compare and Contrast between Genetic Algorithm and Neural Network using suitable examples and diagrams. (CO5,K3) 10
- 8-b. Explain Swarm Intelligence and Ant Colony Optimization in detail. (CO5,K3) 10