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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: VI - THEORY EXAMINATION (2025 - 2026)

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:-

- | | | |
|-------|---|---|
| (1.1) | NLP stand for _____ (CO1, K1) | 1 |
| | (a) Neural Learning Protocol | |
| | (b) Natural Learning Process | |
| | (c) Natural Language Processing | |
| | (d) Neural Language Processing | |
| (1.2) | Which of the following agent take select actions on the basis of the current percept? (CO1, K1) | 1 |
| | (a) Model based Reflex Agent | |
| | (b) Simple Reflex Agent | |
| | (c) Utility Based Agent | |
| | (d) Goal based Agent | |
| (1.3) | A* algorithm is based on _____. (CO2, K1) | 1 |
| | (a) Breadth-First-Search | |
| | (b) Depth-First –Search | |
| | (c) Best-First-Search | |
| | (d) Hill climbing | |
| (1.4) | LIFO is _____ Data structure. (CO2, K1) | 1 |
| | (a) Stack | |
| | (b) Queue | |
| | (c) Priority Queue, Stack | |
| | (d) Priority Stack | |

- (1.5) _____ is a symbol used to build complex sentences in knowledge representation. (CO3, K1) 1
- (a) Resolution
 - (b) Logical Connective
 - (c) Quantifier
 - (d) Proposition
- (1.6) A knowledge-based agent can be defined with _____ levels. (CO3, K1) 1
- (a) 2 Levels
 - (b) 3 Levels
 - (c) 4 Levels
 - (d) None of the above
- (1.7) The value of fuzzy set is _____ (CO4, K1) 1
- (a) Between 0 & 1
 - (b) Either 0 or 1
 - (c) Only 1
 - (d) Only 0
- (1.8) Which of the following strategies used by Inference Engine? (CO4, K1) 1
- (a) Forward Chaining
 - (b) Block Chaining
 - (c) Stable Chaining
 - (d) Both A and B
- (1.9) A plan that describe how to take actions in levels of increasing refinement and specificity is _____ (CO5, K1) 1
- (a) Problem solving
 - (b) Planning
 - (c) Non-hierarchical plan
 - (d) Hierarchical plan
- (1.10) Clustering is a technique of _____. (CO5, K1) 1
- (a) Active learning
 - (b) Supervised learning
 - (c) Reinforcement learning
 - (d) Unsupervised learning

2. Attempt all parts:-

- (2.1) Define a Virtual agent with example. (CO1, K2) 2
- (2.2) What is Local Search? (CO2, K2) 2
- (2.3) Define Inverse in Propositional Logic. (CO3, K2) 2
- (2.4) Write a short note on common sense reasoning. (CO4, K2) 2
- (2.5) What are the applications of Machine learning in daily life? (CO5, K2) 2

SECTION-B

30

Answer any one of the following:-

(3.1)	Write the various scopes and applications of Artificial intelligence. (CO1, K2)	6
(3.2)	Explain the structure of Intelligent agent with diagram. (CO1, K3)	6
Answer any one of the following:-		
(3.3)	Explore the 8-puzzle problem in artificial intelligence and which strategy is best to solve it? (CO2, K3)	6
(3.4)	Describe the various properties of search algorithm. (CO2, K3)	6
Answer any one of the following:-		
(3.5)	Differentiate between Propositional Logic and Predicate Logic. (CO3, K3)	6
(3.6)	Solve N queen problem in artificial intelligence with pre-define constraint. (CO3, K3)	6
Answer any one of the following:-		
(3.7)	Describe the architecture of expert system with diagram. (CO4, K3)	6
(3.8)	Discuss the forward chaining and write the properties of forward chaining. (CO4, K3)	6
Answer any one of the following:-		
(3.9)	Write the differences between supervised and unsupervised learning with example. (CO5, K3)	6
(3.10)	What is the artificial neural network? Discuss the different types of layers in ANN. (CO5, K3)	6
SECTION-C		50
4. Answer any <u>one</u> of the following:-		
(4.1)	Explain the various approaches of Artificial Intelligence with example. (CO1, K3)	10
(4.2)	How to Solve Constraint Satisfaction Problems. Explain with example. (CO1, K3)	10
5. Answer any <u>one</u> of the following:-		
(5.1)	Explain Best First Search technique with suitable example. (CO2, K3)	10
(5.2)	Explain depth-first search algorithm with suitable example. Discuss advantages and disadvantages of DFS. (CO2, K3)	10
6. Answer any <u>one</u> of the following:-		
(6.1)	Explain Water Jug Problem using state space search and use production rules for this problem. (CO3, K3)	10
(6.2)	Explain propositional logic and apply various logical connectives with symbol in propositional logic. (CO3, K3)	10
7. Answer any <u>one</u> of the following:-		
(7.1)	What is expert system? Describe the various components of expert system. (CO4, K3)	10
(7.2)	Discuss the utility theory and also discuss the various applications of utility theory. (CO4, K3)	10
8. Answer any <u>one</u> of the following:-		
(8.1)	Discuss the fundamental components of reinforcement learning with the help of an example. (CO5, K3)	10
(8.2)	What is planning? Explain the continuous planning with example (CO5, K3)	10