

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA**(An Autonomous Institute Affiliated to AKTU, Lucknow)****B.Tech****SEM: VI - THEORY EXAMINATION (2022-2023)****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-a. _____ takes the current percept as input. (CO1) 1
- (a) Agent target
(b) Agent program
(c) Agent function
(d) None of these
- 1-b. The rational agent approach considers which of the following trait as evidence of machine intelligence. (CO1) 1
- (a) Acting humanly
(b) Thinking humanly
(c) Acting rationally
(d) Thinking rationally
- 1-c. Breadth first search uses ____ Queue. (CO2) 1
- (a) FIFO
(b) LIFO

- (c) HIFO
- (d) FILO
- 1-d. Maximum number of nodes in memory represent. (CO2) 1
- (a) Completeness
 - (b) Time complexity
 - (c) Space complexity
 - (d) Optimality
- 1-e. Pick up the false statement for propositional Logic. (CO3) 1
- (a) Each sentence is a declarative sentence
 - (b) Propositional logic is a knowledge representation technique in AI
 - (c) The sentences of Propositional logic can have answers other than True or False
 - (d) None of these
- 1-f. Which of the following represent the "completeness" in Knowledge representation? (CO3) 1
- (a) formal structure of sentences
 - (b) truth of sentences with respect to models
 - (c) derivations produce only entailed sentences
 - (d) derivations can produce all entailed sentences
- 1-g. Ontological commitment in probability theory is (CO4) 1
- (a) Objects
 - (b) Facts
 - (c) Relations
 - (d) Times
- 1-h. The purpose of a Bayesian Belief Network is (CO4) 1
- (a) To predict the probability of a particular outcome given a set of observations.
 - (b) To classify data into different categories.
 - (c) To generate new data based on existing data.
 - (d) To perform clustering on data.
- 1-i. In a goal-based agent, the agent selects actions that (CO5) 1
- (a) maximize its utility function
 - (b) minimize its cost function

- (c) achieve a desired goal
(d) all of the above
- 1-j. Convolutional neural networks are commonly used for (CO5) 1
- (a) image recognition tasks
(b) natural language processing tasks
(c) speech recognition tasks
(d) none of the above

2. Attempt all parts:-

- 2.a. Define Percept. (CO1) 2
- 2.b. Enlist the different Blind search algorithm in AI. (CO2) 2
- 2.c. Explain the term Clauses in Propositional Logic. (CO3) 2
- 2.d. Draw the architecture of expert system. (CO4) 2
- 2.e. Define multiagent planning. (CO5) 2

SECTION B

30

3. Answer any five of the following:-

- 3-a. Write the PEAS description of Taxi driving. (CO1) 6
- 3-b. Write pseudocode agent programs for the goal-based agents. (CO1) 6
- 3-c. Explain Local search algorithm. (CO2) 6
- 3-d. Explain the different parameters for evaluating the performance of Search strategies. (CO2) 6
- 3.e. Represents the following facts in predicate logic: a. Rajiv only likes cricket game b. Roses are red c. John is father of Bob.(CO3) 6
- 3.f. Write the short note on (i) Ontological engineering (ii) Epistemological engineering. (CO4) 6
- 3.g. Describe ant colony optimization agents. (CO5) 6

SECTION C

50

4. Answer any one of the following:-

- 4-a. Explain the foundation of Artificial Intelligence. (CO1) 10
- 4-b. Explain the different steps to design a well- defined Learning System in detail. (CO1) 10

5. Answer any one of the following:-

- 5-a. Define search tree and frontier. Also write the difference between State space and Search tree. (CO2) 10

5-b. Compare the performance of Breadth first search and Depth first search. (CO2) 10

6. Answer any one of the following:-

6-a. Three missionaries and three cannibals are on one side of a river, along with a boat that can hold one or two people. Find a way to get everyone to the other side without ever leaving a group of missionaries in one place outnumbered by the cannibals in that place. a.) Formulate the problem precisely, making only those distinctions necessary to ensure a valid solution. Draw a diagram of the complete state space. b.) Implement and solve the problem optimally using an appropriate search algorithm. (CO3) 10

6-b. Explain Monkey banana problem in detail. (CO3) 10

7. Answer any one of the following:-

7-a. Compare forward chaining and backward chaining in detail. (CO4) 10

7-b. Describe resolution and probabilistic reasoning in AI. (CO4) 10

8. Answer any one of the following:-

8-a. What do you understand by inductive learning algorithm (ILA). Explain in detail. (CO5) 10

8-b. Write the difference between supervised, unsupervised and reinforcement learning with appropriate block diagram. (CO5) 10