

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B,Tech.

SEM: III - 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. Artificial intelligence is about (CO1) 1
- (a) Putting your intelligence into Computer
  - (b) Programming with your own intelligence
  - (c) Making a Machine intelligent
  - (d) Playing a Game
- 1-b. Which agent deals with happy and unhappy states.(CO1) 1
- (a) Simple reflex agent
  - (b) Model based agent
  - (c) Learning agent
  - (d) Utility based agent
- 1-c. \_\_\_\_\_complexity is a measure of time for an algorithm to complete its task.(CO2) 1
- (a) Cost
  - (b) Path
  - (c) Time

(d) Space

- 1-d. The search strategy the uses a problem specific knowledge is known as \_\_\_\_\_.(CO2) 1
- (a) Uninformed search
  - (b) Informed search
  - (c) Depth-first search
  - (d) None of the mentioned
- 1-e. Semantic Network represents \_\_\_\_\_.(CO3) 1
- (a) Syntactic relation between concepts
  - (b) Semantic relations between concepts
  - (c) All of the mentioned
  - (d) None of the mentioned
- 1-f. Knowledge comes from processed information which at the root level comes from the \_\_\_\_\_.(CO3) 1
- (a) Knowledge
  - (b) Intelligence
  - (c) Information
  - (d) Data
- 1-g. In a Bayesian network variable is----(CO4) 1
- (a) Continuous
  - (b) Discrete
  - (c) Both A and B
  - (d) None of the above
- 1-h. \_\_\_\_\_ systems are Data-driven, whereas backward chaining systems are goal-driven.(CO4) 1
- (a) Backward Chaining
  - (b) Forward Chaining
  - (c) Spanning Chaining
  - (d) None of the above
- 1-i. Reinforcement learning is- (CO5) 1
- (a) Supervised
  - (b) Unsupervised
  - (c) Reward based

|           |                                                                                                                                                                                                                                       |    |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
|           | (d) None of the above                                                                                                                                                                                                                 |    |
| 1-j.      | The probabilistic reasoning depends upon_____.(CO5)                                                                                                                                                                                   | 1  |
|           | (a) Estimation                                                                                                                                                                                                                        |    |
|           | (b) Observation                                                                                                                                                                                                                       |    |
|           | (c) Likelihood                                                                                                                                                                                                                        |    |
|           | (d) All of the mentioned                                                                                                                                                                                                              |    |
| 2.        | Attempt all parts:-                                                                                                                                                                                                                   |    |
| 2.a.      | Explain the Goal of Artificial Intelligence.(CO1)                                                                                                                                                                                     | 2  |
| 2.b.      | Explain uninformed search in detail. (CO2)                                                                                                                                                                                            | 2  |
| 2.c.      | Explain the term Clauses in Propositional Logic.(CO3)                                                                                                                                                                                 | 2  |
| 2.d.      | Explain Forward Chaining with example.(CO4)                                                                                                                                                                                           | 2  |
| 2.e.      | Give an example of Bayesian Network.(CO5)                                                                                                                                                                                             | 2  |
| SECTION B |                                                                                                                                                                                                                                       | 30 |
| 3.        | Answer any <u>five</u> of the following:-                                                                                                                                                                                             |    |
| 3-a.      | Give a brief introduction to the Turing test in AI? (CO1)                                                                                                                                                                             | 6  |
| 3-b.      | Distinguish between strong and weak artificial intelligence.(CO1)                                                                                                                                                                     | 6  |
| 3-c.      | Explain the DFS algorithm with example.(CO2)                                                                                                                                                                                          | 6  |
| 3-d.      | Explain any Heuristic search algorithm in detail with suitable example.(CO2)                                                                                                                                                          | 6  |
| 3.e.      | Consider following set of sentences in English: If Jim is a student then he is registered in a college. Jim did not register in a college. Jim is not a student. Show that whether they are mutually consistent or inconsistent.(CO3) | 6  |
| 3.f.      | A knowledge-based agent can be viewed at different levels. Explain.(CO4)                                                                                                                                                              | 6  |
| 3.g.      | Explain the genetic algorithm using example.(CO5)                                                                                                                                                                                     | 6  |
| SECTION C |                                                                                                                                                                                                                                       | 50 |
| 4.        | Answer any <u>one</u> of the following:-                                                                                                                                                                                              |    |
| 4-a.      | Explain different types of Artificial Intelligence.(CO1)                                                                                                                                                                              | 10 |
| 4-b.      | Explain History of Artificial Intelligence in detail. (CO1)                                                                                                                                                                           | 10 |
| 5.        | Answer any <u>one</u> of the following:-                                                                                                                                                                                              |    |
| 5-a.      | Explain the problems in hill climbing in details with examples.(CO2)                                                                                                                                                                  | 10 |
| 5-b.      | Explain the Alpha - Beta pruning algorithms in detail.(CO2)                                                                                                                                                                           | 10 |
| 6.        | Answer any <u>one</u> of the following:-                                                                                                                                                                                              |    |

- 6-a. Explain various ways of Knowledge Representation with an example of each.(CO3) 10
- 6-b. Explain the algorithm of Resolution in Propositional logic with suitable example.(CO3) 10
7. Answer any one of the following:-
- 7-a. Explain Expert System and how it is implemented in real life. Also list its pros and cons.(CO4) 10
- 7-b. Define Hidden Markov model with appropriate example. State its drawbacks.(CO4) 10
8. Answer any one of the following:-
- 8-a. List down some popular algorithms used for deriving Decision Trees along with their attribute selection measures. Explain any one in detail.(CO5) 10
- 8-b. Explain the Bayesian Statistics and Bayes Theorem? How Bayesian Statistics is related to Machine Learning.(CO5) 10