NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech.

SEM: III - THEORY EXAMINATION (2021 - 2022)

Subject: Introduction to Artificial Intelligence

Time: 03:00 Hours   Max. Marks: 100

General Instructions:

1. All questions are compulsory. It comprises of three Sections A, B and C.

- Section A - Question No- 1 is objective type question carrying 1 mark each & Question No- 2 is very short type questions carrying 2 marks each.
- Section B - Question No- 3 is Long answer type - I questions carrying 6 marks each.
- Section C - Question No- 4 to 8 are Long answer type - II questions carrying 10 marks each.
- 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 AI"? (CO1)   1

        1. Fisher Ada

        2. Alan Turing

        3. John McCarthy

        4. Allen Newell

1-b.   Which of the given language is not commonly used for AI? (CO1)   1

        1. LISP

        2. PROLOG

        3. Python

        4. Perl

1-c.   Heuristic function of greedy best-first search denoted as _____. (CO2)   1

        1. $f(n) \mathrel{!}= h(n)$

        2. $f(n) < h(n)$

        3. $f(n) = h(n)$

        4. $f(n) > h(n)$

1-d.   A* algorithm is based on _____. (CO2)   1

        1. Depth-first search

        2. Breadth-first search

        3. Hill climbing search

        4. Best-First-Search

1-e.   Semantic nets consists of? (CO3)   1

        1. Node

        2. Edges

        3. Labels

        4. All of the above

1-f.   Which graph is used to represent semantic network? (CO3)   1

        1. Undirected graph

        2. Directed graph

        3. Directed Acyclic graph

        4. Directed complete graph

1-g.   Bayesian Belief Network is also known as ? (CO4)   1

        1. Belief network

        2. Decision network

        3. Bayesian model

        4. All of the above

1-h.   What are the undesirable properties of knowledge? (CO4)   1

        1. Voluminous

        2. Difficult to characterize

        3. Variability

        4. All of the above

1-i.   To eliminate the inaccuracy problem in planning problem or partial order planning problem we can use (CO5)   1

        1. Stacks

        2. Queues

        3. BST

        4. Planning graphs

1-j.   What is the rule of simple reflex agent? (CO5)   1

        1. Simple action rule

        2. Condition action rule

        3. Simple & Condition action rule

        4. None of the above

2. Attempt all parts:-

2-a.   How is Artificial Intelligence is related to Machine learning? (CO1)   2

2-b.   The iterative deepening algorithm is a combination of DFS and BFS algorithms. Comment on the statement. (CO2)   2

2-c.   Explain different types of Knowledge used in Artificial Intelligence. (CO3)   2

2-d.   Explain Uncertainty management in Expert Systems. (CO4)   2

2-e.   Explain Symbolic Reasoning with an example. (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.   Explain intelligent agents and their uses in artificial intelligence? (CO1)   6

3-c.   Explain the hill climbing algorithm with example. (CO2)   6

3-d.   "Breadth First Search guarantees the solution, if it exists." Comment on the   6
            statement. (CO2)

3-e.   Explain Monkey Banana Problem in detail. (CO3)   6

3-f.   What do you mean by Markov Chains? Explain the areas where HMM is used. (CO4)   6

3-g.   Explain the Multi agent system in details with example. (CO5)   6

<div align="center">SECTION C   50</div>

4. Answer any <u>one</u> of the following:-

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

4-b.   Explain History of Artificial Intelligence in detail. (CO1)   10

5. Answer any <u>one</u> of the following:-

5-a.   Write down the steps for A* algorithm with example? (CO2)   10

5-b.   Explain the Minimax Algorithm in detail. (CO2)   10

6. Answer any <u>one</u> of the following:-

6-a.   Explain 8 Queens problem with its algorithm. (CO3)   10

6-b.   What do you mean by Resolution in Predicate Logic? Explain using algorithm. (CO3)   10

7. Answer any <u>one</u> of the following:-

7-a.   Draw and explain the architecture of Knowledge Based System. (CO4)   10

7-b.   Explain the operations performed by agent to show the intelligent behaviour through   10
            practical example. (CO4)

8. Answer any <u>one</u> of the following:-

8   Define the Bayesian Network in detail with example. (CO5)   10

8   Differentiate between Genetic Algorithm and Neural Network. (CO5)   10