Roll No. | | | | | | | | | | | | |

B.TECH
(SEM V) THEORY EXAMINATION 2022-23
ARTIFICIAL INTELLIGENCE

Time: 3 Hours   *Total Marks: 100*

Note: Attempt all Sections. If you require any missing data, then choose suitably.

SECTION A

1.   **Attempt *all* questions in brief.**   2x10 = 20

(a)   Differentiate between Artificial Intelligence, Machine Learning & Deep Learning.

(b)   How are task environments and rational agents related?

(c)   Define Backtracking Search.

(d)   Define Constraint Satisfaction problems.

(e)   Differentiate between forward chaining and backward chaining.

(f)   Apply the concepts of upper ontology with an example.

(g)   Define the characteristics of Information retrieval.

(h)   Define Argumentation among multi-agent systems.

(i)   Differentiate between machine translation & Speech recognition.

(j)   Define Skeletonization method and Voronoi graph.

SECTION B

2.   **Attempt any *three* of the following:**   10x3 = 30

(a)   Define four categories of Intelligent Systems.

(b)   Prove that following sentence is valid " If price fall then sell increases. If sell increases then Jhon makes the whole money. But John doesn't make the whole money. Therefore , price do not fall".

(c)   Convert each of the following sentences
  * first into Predicate logic
  * and then in Clausal Form/Prenex Normal Form
  * and then do Resolution for goal:- Scrooge is not a child.
  (i) Every child loves Santa.
  (ii) Everyone who loves Santa loves any reindeer.
  (iii)Rudolph is a reindeer, and Rudolph has a red nose.
  (iv)Anything which has a red nose is weird or is a clown.
  (v) No reindeer is a clown.
  Scrooge does not love anything which is weird.

(d)   Give diagram of abstract model for interoperating software agents.

(e)   Define Artificial Intelligence. List the six disciplines needed for an Intelligent System to pass the Turing Test.

SECTION C

3.   **Attempt any *one* part of the following:**   10x1 = 10

(a)   Define Artificial Intelligence. List the Six disciplines needed for an Intelligent System to pass the Turing Test.

(b)   Explain possible approaches to solve typical AI problems.

4.   **Attempt any *one* part of the following:**   **10 x1 = 10**

   (a)   Demonstrate Alpha-Beta pruning algorithm with suitable example.
   (b)   Define Heuristic search. Explain Greedy Best First Search algorithm
         with an example.

5.   **Attempt any *one* part of the following:**   **10x1 = 10**

   (a)   Solve following 8-puzzle problem with the help of A* Algorithm

2	8	3
1	6	4
7		5

Initial State

1	2	3
8		4
7	6	5

Final State

   (b)   There is a monkey at the door in a room. In the middle of the room a
         bunch of banana is hanging from the ceiling. The monkey is hungry
         and wants to get the banana but je cannot stretch high enough from the
         floor. At the window of the room there is a box. Represent the
         information used in the above mentioned problem in predicate logic.

6.   **Attempt any *one* part of the following:**   **10x1 = 10**

   (a)   Explain Trust and Reputation in Multi-Agent Systems with examples.
   (b)   Define Intelligent agent. Also explain four classes of agents in
         architectures for intelligent agents.

7.   **Attempt any *one* part of the following:**   **10x1 = 10**

   (a)   Describe the role of computer vision in Artificial Intelligence.
   (b)   Define pattern recognition. Explain design principles of pattern
         recognition systems with suitable examples.