NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)
B.Tech.
SEM: III - CARRY OVER THEORY EXAMINATION - JUNE (2021 - 2022)
Subject: Introduction to Artificial Intelligence

Time: 3 Hours   Max. Marks: 100

General Instructions:
1. The question paper comprises three sections, A, B, and C. You are expected to answer them as directed.
2. Section A - Question No- 1 is 1 marker & Question No- 2 carries 2 mark each.
3. Section B - Question No-3 is based on external choice carrying 6 marks each.
4. Section C - Questions No. 4-8 are within unit choice questions carrying 10 marks each.
5. 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.   The PEAS in the task environment is about (CO1)   1
                (a) Peer, Environment, Actuators, Sense
                (b) Performance, Environment, Actuators, Sensors
                (c) Perceiving, Environment, Actuators, Sensors
                (d) None of the above

1-b.   A.M. turing developed a technique for determining whether a computer could or could not   1
          demonstrate the artificial Intelligence, Presently, this technique is called _____ (CO1)
                (a) Turing Test
                (b) Algorithm
                (c) Boolean Algebra
                (d) Logarithm

1-c.   Blind term is general term for _____.(CO2)   1
                (a) Uninformed search
                (b) Informed search
                (c) Heuristic search
                (d) None of the mentioned

1-d.   What is state space? (CO2)   1
                (a) The whole problem
                (b) Your Definition to a problem
                (c) Problem you design
                (d) Representing your problem with variable and parameter

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.   What is transposition rule? (CO3)   1
                (a) From $p \rightarrow q$, infer $\sim q \rightarrow p$
                (b) From $p \rightarrow q$, infer $q \rightarrow \sim p$
                (c) From $p \rightarrow q$, infer $q \rightarrow p$
                (d) From $p \rightarrow q$, infer $\sim q \rightarrow \sim p$

1-g. A rule-based system can be simply created by using(CO4)   1

      (a) Assertions
      (b) Rules
      (c) Set of assertions
      (d) All of the above

1-h. Backward chaining rule is?(CO4)   1

      (a) Goal driven
      (b) Data driven
      (c) Both A and B
      (d) None of these

1-i. What are the composition for agents in artificial intelligence? (CO5)   1

      (a) Program
      (b) Architecture
      (c) Both Program and Architecture
      (d) None of the above

1-j. Which is used to improve the agents performance (CO5)   1

      (a) Perceiving
      (b) Learning
      (c) Observing
      (d) None of the above

2. Attempt all parts:-

2.a.	How is machine learning related to AI? (CO1)	2
2.b.	what do you understand by Game Tree in adversarial Search?(CO2)	2
2.c.	What do you mean by Resolution in Predicate Logic?(CO3)	2
2.d.	Define various types of knowledge.(CO4)	2
2.e.	What is the role of actuator in agent? (CO5)	2

<div align="center">SECTION B   30</div>

3. Answer any <u>five</u> of the following:-

3.a.	Give some real-world applications of AI.(CO1)	6
3.b.	What are different types of Agents in Artificial Intelligence?(CO1)	6
3.c.	Explain the hill climbing algorithm with example. (CO2)	6
3.d.	Describe Uniform Cost Search in detail.(CO2)	6
3.e.	Explain Monkey Banana Problem in detail. (CO3)	6
3.f.	Describe Architecture of Expert System in detail.(CO4)	6
3.g.	What is the difference between supervised and unsupervised machine learning?(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 difference between BFS and DFS.(CO2)	10
5.b.	How does the Means-Ends Analysis work?(CO2)	10

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

6.a.	Convert each of the formula to CNF and DNF: i.) (PV~R) V (Q^R) ii.) (P^~QVR) V (Q^R) (CO3)	10

6.a. You are given 3 jars with capacity of 8,5 and 3 litres respectively. The jar with capacity 8   10
      litres is completely filled with water, the water is to be divided into 4 litres and 4 litres in jars
      of capacity 8l and 5l respectively. Write the steps to solve this AI Problem (CO3)

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

7.a. Explain Forward Chaining and Backward Chaining with diagram.(CO4)   10

7.b. Define Hidden Markov model with appropriate example. State its drawbacks.(CO4)   10

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

8.a. Explain Swarm Intelligence with example(CO5)   10

8.b. What do you mean by Neural Net learning and Genetic learning?(CO5)   10