NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)
MCA
SEM: IV - THEORY EXAMINATION (2024 - 2025)
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.　　　What are the composition for agents in artificial intelligence?(CO1,K1)　　1

　　(a)　Program
　　(b)　Architecture
　　(c)　Both Program & Architecture
　　(d)　None of the mentioned

1-b.　　　The term AI was coined in the year.(CO1,K1)　　1

　　(a)　1965
　　(b)　1956
　　(c)　1944
　　(d)　1952

1-c.　　　Among the given options, which search algorithm requires less memory?(CO2,K1)　　1

　　(a)　Depth-first search
　　(b)　Breadth-first search
　　(c)　Linear Search
　　(d)　Optimal Search

1-d.　　　Which type of best first search algorithm was used to predict the closeness of the end of path and its solution?(CO2,K1)　　1

　　(a)　Greedy BFS

     (b)   Divide and Conquer

     (c)   Heuristic BFS

     (d)   Combinatorial

1-e.   In a Bayesian network variable is?(CO3,K2)   1

     (a)   Continuous

     (b)   Discrete

     (c)   Both A and B

     (d)   None of the above

1-f.   What is a Semantic Net?(CO3,K1)   1

     (a)   A data structure used to represent mathematical functions.

     (b)   A graph structure used to represent relationships between concepts in knowledge representation.

     (c)   A type of neural network used for learning patterns.

     (d)   A storage system for managing large databases of text documents.

1-g.   Reinforcement learning is-(CO4,K1)   1

     (a)   Supervised

     (b)   Unsupervised

     (c)   Reward based

     (d)   None of the above

1-h.   What does K stand for in K mean algorithm?(CO4,K2)   1

     (a)   Number of clusters

     (b)   Number of data

     (c)   Number of attributes

     (d)   Number of iterations

1-i.   Which is Dimensionality reduction technique?(CO5,K1)   1

     (a)   PCA

     (b)   LDA

     (c)   GDA

     (d)   SVM

1-j.   Which of the following is used study of construction of words from primitive meaningful units?(CO5,K1)   1

     (a)   Phonology

     (b)   Morphology

     (c)   Morpheme

     (d)   Shonology

2. Attempt all parts:-

2.a.   What does the Turing Test measure?(CO1,K1)   2

2.b.   What is the purpose of using heuristics in search strategies?(CO2,K2)   2

2.c.	Define various types of knowledge.(CO3,K2)	2
2.d.	What is the need of machine learning?(CO4,K2)	2
2.e.	Explain Semantic Analysis.(CO5,K1)	2

SECTION-B 30

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

3-a.	What are the different types of Artificial Intelligence? Explain how can AI be used in detecting fraud.(CO1,K1)	6
3-b.	Explain the logic behind targeted marketing. How can Artificial Intelligence help with this.(CO1,K2)	6
3-c.	What do you mean by well-defined Learning System? Explain the steps to design a well- defined Learning System.(CO2,K2)	6
3-d.	What are the problems associated with Hill Climbing? How these can be overcome?(CO2,K2)	6
3.e.	Discuss various properties of quantifiers.(CO3,K3)	6
3.f.	Elaborate various types of Machine Learning.(CO4,K2)	6
3.g.	List the various common task Associated with Computer Vision.(CO5,K2)	6

SECTION-C 50

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

| 4-a. | Explain Simple Reflex Agents and Model-Based Reflex Agents along with their diagrams.(CO1,K2) | 10 |
| 4-b. | Elaborate evolution of artificial intelligence with its application.(CO1,K2) | 10 |

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

| 5-a. | List some of the uninformed search techniques in detail?(CO2,K2) | 10 |
| 5-b. | How does the Means-Ends Analysis work?(CO2,K2) | 10 |

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

| 6-a. | Can you explain the concept of a Hidden Markov Model with an example, and what are its drawbacks?(CO3,K2) | 10 |
| 6-b. | Explain Proportional logic in AI along with its syntax and types.(CO3,K2) | 10 |

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

| 7-a. | Explain K-Nearest Neighbor(KNN) Algorithm with all steps.(CO4,K3) | 10 |
| 7-b. | Explain briefly various classification techniques.(CO4,K3) | 10 |

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

| 8-a. | Demonstrate the Features of PCA along with its working.(CO5,K2) | 10 |
| 8-b. | What are the key stages involved in processing natural language in NLP systems?.(CO5,K2) | 10 |