MCS-224

MASTER OF COMPUTER APPLICATIONS (MCA-NEW)

Term-End Examination

June, 2022

MCS-224 : ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Time : 3 Hours　　　　　*Maximum Marks : 100*

Weightage : 70%

__Note__ : Question No. __1__ is compulsory. Attempt any __three__ questions from the remaining questions.

1. (a) Compare Narrow AI, General AI and Super AI. Give suitable example for each. 6

   (b) Briefly discuss the formulation of state space search, with a suitable example. 5

P. T. O.

(c) Write DFS (Depth-First Search) algorithm. Give **one** advantage and **one** disadvantage of DFS.   5

(d) Obtain Disjunctive Normal Form for the well form formula given below :   5

$$\sim (A \rightarrow (\sim B \wedge C))$$

(e) Briefly discuss the relevance of resolution and unification mechanism in artificial intelligence.   4

(f) Compare supervised learning and unsupervised learning. List the algorithms for each type of learning.   5

(g) Write Bayes' theorem and elaborate the meaning of each component in it.   5

(h) What is Dimensionality Reduction ? Briefly discuss the ways to achieve it.   5

2. (a) What do you understand by the term "Agents" in Artificial Intelligence ? List the properties, supposed to be possessed by agents. Also, compare the SR (simple reflex) agents with model based reflex agents.   10

(b) Draw the block diagram of machine learning cycle and briefly discuss the role of each of its components. 10

3. (a) What is Adversarial Search ? How it is different from the normal search ? Briefly discuss the types of adversarial search. 10

(b) Differentiate between the following, with an example for each : 10

(i) Machine learning and Data mining

(ii) Multi-class classification and Multi-label classification

4. (a) What is Best First Search ? How is it different from greedy best first search ? Give time complexity and space complexity of best first search. Also, give advantage and disadvantage of best first search. 10

(b) How regression differs from classification ? What is the similarity between the two ? Briefly discuss the following type of regression : 10

(i) Linear regression

(ii) Multiple linear regression

(iii) Logistic regression

(iv) Polynomial regression

5. Write short notes on any *five* of the following :

$5 \times 4 = 20$

(a) Rule based systems and its types

(b) Frames

(c) Dempster Scheffer theory

(d) Closed world assumption

(e) Recursive neural networks

(f) Generative adversarial networks

(g) Support vector machines

(h) Confusion matrix

(i) Linear discriminant analysis

(j) Pincer search