

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

M.B.A.

SEM: III - THEORY EXAMINATION (2022 - 2023)

Subject: Machine Learning & 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 | Data used to build a data mining model. [CO1] | 1 |
| | (a) validation data | |
| | (b) training data | |
| | (c) test data | |
| | (d) hidden data | |
| 1 | PCA is a _____.[CO1] | 1 |
| | (a) Non linear method | |
| | (b) Linear method | |
| | (c) Continuous method | |
| | (d) Repeated method | |
| 1 | A decision tree can be used to build models for _____.[CO2] | 1 |
| | (a) Classification | |
| | (b) Regression | |
| | (c) Both | |

- (d) None
- 1 Pre-pruning the decision tree may result in _____. [CO2] 1
- (a) Underfitting
 - (b) overfitting
 - (c) Underfitting & Overfitting
 - (d) None of the above
- 1 Agglomerative clustering falls under which type of clustering method. [CO3] 1
- (a) partition
 - (b) hierachical
 - (c) density
 - (d) model
- 1 . K means and K-mediods are example of which type of clustering method. [CO3] 1
- (a) partition
 - (b) hierachical
 - (c) density
 - (d) model
- 1 Artificial Intelligence has its expansion in the following application. [CO4] 1
- (a) Planning and Scheduling
 - (b) Game Playing
 - (c) Robotics
 - (d) All of the above
- 1 Explain the name of the computer program that simulates the thought processes of human beings. [CO4] 1
- (a) Human logic
 - (b) Expert reason
 - (c) Expert system
 - (d) Personal information
- 1 LIFO is _____ where as FIFO is _____. [CO5] 1
- (a) Stack, Queue
 - (b) Queue, Stack
 - (c) Priority Queue, Stack

(d) Stack. Priority Queue

- 1 A search algorithm takes _____ as an input and returns _____ as an output. [CO5] 1
- (a) Input, output
- (b) Problem, solution
- (c) Solution, problem
- (d) Parameters, sequence of actions

2. Attempt all parts:-

- 2.a. Discuss the steps involved in KDD process [CO1] 2
- 2.b. List out the two differences between Supervised and unsupervised learning.[CO2] 2
- 2.c. Explain Euclidean distance and manhattan distance.[CO3] 2
- 2.d. Define an Agent. [CO4] 2
- 2.e. Explain Hill Climbing Algorithm. [CO5] 2

SECTION B

30

3. Answer any five of the following:-

- 3 Mention the various types of machine learning techniques.[CO1] 6
- 3 Explain principal component analysis in details.CO1] 6
- 3 Compare Entropy and Information Gain and Gain in ID3 with an example.[CO2] 6
- 3 Differentiate between classification and regression with example.[CO2] 6
- 3.e. Explain how association rule mining helps in Market-basket analysis.[CO3] 6
- 3.f. Define Strong AI, and how is it different from the Weak AI. [CO4] 6
- 3.g. Explain the minimax algorithm along with the different terms. [CO5] 6

SECTION C

50

4. Answer any one of the following:-

- 4 a) Describe the Feature Subset Selection.b) Illustrate the Data Transformation by Normalization.[CO1] 10
- 4 Suppose a group of 12 sales price records has been sorted as follows:5,10,11,13,15,35,50,55,72,92,204,215. Partition them into three bins by each of the following methods:equal-frequency(equal-depth) partitioning, equal-width partitioning ,Clustering[CO1] 10

5. Answer any one of the following:-

- 5 Define Bagging & boosting and its impact on bias and variance.[CO2] 10

- 5 Consider the following set of training examples: (a) What is the entropy of this collection of training examples with respect to the target function classification? (b)What is the information gain of a2 relative to these training examples? [CO2] 10

INSTANCE CLASSIFICATION	A1	A2
1	+ T	T
2	+T	T
3	-T	F
4	+F	F
5	-F	T
6	-F	T

6. Answer any one of the following:-

- 6 Define clustering and also differentiate between k-mean and k-medoid clustering.[CO3] 10
- 6 Give any two types of association rules with example. Trace the results of using the Apriori algorithm on the grocery store example with support threshold 2 and confidence threshold 60 %. Show the candidate and frequent itemsets for each database scan. Enumerate all the final frequent itemsets. Also indicate the association rules that are generated.[CO3] 10

Transaction_ID	Items
T1	HotDogs, Buns, Ketchup
T2	HotDogs, Buns
T3	HotDogs, Coke, Chips
T4	Chips, Coke
T5	Chips, Ketchup
T6	HotDogs, Coke, Chips

7. Answer any one of the following:-

- 7 Explain computer vision in parlance to the artificial intelligence. [CO4] 10
- 7 Describe PEAS with example [CO4] 10

8. Answer any one of the following:-

- 8 Explain difference between Greedy Best First Search and Uniform Cost search. [CO5] 10
- 8 Explain adversarial Search.Which type of problem is solved through adversarial Search. [CO5] 10