Printed Page:- Subject Code:- AEC0516

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech.

SEM: V - THEORY EXAMINATION (2022 - 2023)

Subject: Machine Learning

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 Application of machine learning methods to a large database is called? (CO1) 1

(a) Big data computing

(b) Internet of Things

(c) Data mining

(d) Artificial Intelligence

1 Which of the following statement is true about outliers in Linear regression? (CO1) 1

(a) Linear regression is sensitive to outliers

(b) Linear regression is not sensitive to outliers

(c) Can't say

(d) None of these

1 _____neural network was the first and simplest type of artificial neural network devised. (CO2) 1

(a) feedbackward neural network

(b) Feed neutral Neural network

(c) feedforward neural network

(d) None of these

1	The Euclidean distance between two set of numerical attributes is called ? (CO2)	1

(a) Closeness

(b) Validation Data

(c) Error Rate

(d) None of these

1	The effectiveness of an SVM depends upon: (CO3)	1

(a) Selection of Kernel

(b) Kernel Parameters

(c) Soft Margin Parameter C

(d) All of the above

1	Which of the following can be used to create sub–samples using a maximum dissimilarity approach ? (CO3)	1

(a) minDissim

(b) maxDissim

(c) inmaxDissim

(d) All of the Mentioned

1	Which of the following are the two key characteristics of the Genetic Algorithm? (CO4)	1

(a) Crossover techniques and Fitness function

(b) Random mutation and Crossover techniques

(c) Random mutation and Individuals among the population

(d) Random mutation and Fitness function

1	Hill-Climbing algorithm terminates in which of the following conditions? (CO4)	1

(a) Stopping criterion met

(b) Global Min/Max is achieved

(c) No neighbor has a higher value

(d) All of these

1	Choose from the following that are Decision Tree nodes? (CO5)	1

(a) Decision Nodes

(b) Leaf nodes

(c) Root nodes

(d) All of the mentioned

1	Is it possible that assignment of observations to clusters does not change between successive iterations in K-Means (CO5)	1

(a) Yes

(b) No

(c) Can't say

(d) None of these

2. Attempt all parts:-

2.a.	What is the Euclidean distance. (CO1)	2
2.b.	What do you mean by Perceptron? (CO2)	2
2.c.	Explain Ebow Method. (CO3)	2
2.d.	What are the three parts of any optimization problem? (CO4)	2
2.e.	Define reward function. (CO5)	2

SECTION B 30

3. Answer any five of the following:-

3	What is the appropriate learning strategy for a given imbalanced dataset ? (CO1)	6
3	What is the difference between Data Mining and Machine Learning? (CO1)	6
3	What is a Gradient and Gradient Descent? Explain. (CO2)	6
3	How does the learning rate affect the training of the Neural Network? (CO2)	6
3.e.	What is the nature of the hypothesis space H implicitly considered by the K-nearest neighbour algorithm? (CO3)	6
3.f.	What are the genetic operators? Which one is most suitable operator for optimization problems? (CO4)	6
3.g.	What type of problems can be solved using decision tree learning. (CO5)	6

SECTION C 50

4. Answer any one of the following:-

4	What are the key differences between supervised and unsupervised machine learning? (CO1)	10
4	Illustrate the univariate normal distribution model through the suitable example. (CO1)	10

5. Answer any one of the following:-

5	What are combination, activation, Error, and Objective Functions? (CO2)	10

5	Discuss, on what factor the number of neurons in each layer shall depend on? (CO2)	10
6. Answer any one of the following:-		
6	Can LDA be used as a multi-class classifier? If so how would it work? (CO3)	10
6	How PCA Can be used to reduce the dimensionality of a highly nonlinear dataset? Explain. (CO3)	10
7. Answer any one of the following:-		
7	Explain the operation of Hill climbing algorithm with suitable graph. State its advantages and limitaions. (CO4)	10
7	Explain the operation of linear embedding with suitable example. (CO4)	10
8. Answer any one of the following:-		
8	Enlist the names of few algorithms which are used to solve a problem in Reinforcement Learning. (CO5)	10
8	Discuss the vector quantization approach with suitable diagram. (CO5)	10