Roll No.....

Enrolment No.....

JAMIA HAMDARD
School of Engineering Sciences and Technology
Department of Computer Science & Engineering

Supplementary/Improvement Examination - 2023

Subject: Machine Learning

Subject Code: BTCSE - DED13

TIME: 3 Hours **MAX. MARKS: 75**

Note: 1) Immediately write your Roll No. and Enrolment No. after receiving the Question Paper.
2) Do not write anything on the Question Paper.
3) Scientific Calculator is allowed without Memory Feature.
4) Please follow proper numbering while answering the questions.

SECTION – A (35 Marks)

❖ *Attempt **ALL** questions. Each question is of **5 marks**.*

Q. No.	Questions	CO*	BL*
1.	What do you understand by noise in the data? How it affects the result explain with examples.	CO1	L1, L2
2.	When should you use classification over regression? Explain using example.	CO4	L2, L3
3.	How is learning accomplished in reinforcement learning? Explain with suitable example.	CO3	L2, L3
4.	What do you understand by overfitting of data? Give any two methods to avoid overfitting.	CO5	L3, L4, L5
5.	Why the cost function is also called mean squared error function? Explain.	CO2	L2, L3
6.	Calculate the covariance matrix for this three dimensional set of data. <table><tr><td>Item No.</td><td>1</td><td>2</td><td>3</td></tr><tr><td>x</td><td>1</td><td>-1</td><td>4</td></tr><tr><td>y</td><td>2</td><td>1</td><td>3</td></tr><tr><td>z</td><td>1</td><td>3</td><td>-1</td></tr></table>	CO2	L4, L5, L6
7.	What activations functions are used in artificial neural network? Explain.	CO3	L1, L2

SECTION – B (40 Marks)

❖ *Attempt any **FOUR** questions. Each question is of **10 marks**.*

Q. No.	Questions	CO*	BL*
1.	What are the metrics used in judging the accuracy of prediction? Explain	CO3	L2, L3
2.	How does maximum likelihood estimation help in computing the parameters of logit function?	CO4	L3, L4

3.	Apply K nearest neighbor classifier to predict the diabetic patient with the given features BMI, Age. If the training examples are: Assume K=3, Test Example BMI=43.6, Age=40, Sugar=?	CO5	L3, L4, L5
4.	Compute the Principal Component of following data set: X=4, 8, 13, 7 and Y=11, 4, 5, 14	CO4	L3, L4, L5
5.	Create the relationship model for the data given in table below and also predict Y for X=11.324	CO5	L3, L5, L6
6.	Draw a Decision Tree for the following data using Information gain. Training set: 3 features and 2 classes:	CO5	L4, L5, L6

BMI	AGE	SUGAR
33.6	50	**Y**
26.6	30	**N**
23.4	40	**N**
43.1	67	**N**
35.3	23	**Y**
35.9	67	**Y**
36.7	45	**Y**
25.7	46	**N**
23.3	29	**N**
31	56	**Y**

Observations	X	Y
1	0.132	10.325
2	0.234	16.852
3	0.145	12.063
4	0.956	121.987
5	0.681	78.061

Instance	X	Y	Z	C
1	1	1	1	Super
2	1	1	0	Super
3	0	0	1	Medium
4	1	0	0	Medium

CO* - Course Outcomes from Syllabus, BL* - Bloom's Taxonomy Levels (1: Remembering, 2: Understanding, 3: Applying, 4: Analyzing, 5: Evaluating, 6: Creating)

END