Set - C

K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

Nov – Dec 2024
(B. Tech) Program: Computer Engineering Scheme II
Regular Examination :LY Semester: VII
Course Code: CEC701 and Course Name: Machine Learning
Date of Exam: 26/11/24 Duration: 02.5 Hours Max. Marks: 60

Instructions:
(1) All questions are compulsory.
(2) Draw neat diagrams wherever applicable.
(3) Assume suitable data, if necessary.

Q. No.	Question	Max. Marks	CO	BT level
Q 1	**Solve any two questions out of three: (05 marks each)**	10		
a)	Consider the following confusion metrics given below and compute Accuracy, precision, recall, F1 score and specificity		CO3	Ap
b)	Explain sequence covering algorithm with reference to rule based classification.		CO4	U
c)	Consider the distance matrix given below and perform density based clustering with epsilon=5 and min_points=5.		CO5	Ap
Q 2	**Solve any two questions out of three: (05 marks each)**	10		
a)	Explain applications of clustering.		CO5	U
b)	Explain with examples following terms with reference to support vector machine		CO4	U

	Predicted Class (YES)	Predicted Class (NO)
Actual Class (YES)	123	20
Actual Class (NO)	33	161

	A	B	C	D	E	F	G	H
A	0	1	2.23	2.82	7.07	7.81	7.81	8.48
B	1	0	2	2.23	6.4	7.07	7.07	7.81
C	2.23	2	0	1	5	4.89	5.65	6.4
D	2.82	2.23	1	0	4.24	5.2	6.25	5.65
E	7.07	6.4	5	4.24	0	1	1	1.41
F	7.81	7.07	4.89	5.2	1	0	1.41	1
G	7.81	7.07	5.65	6.25	1	1.41.	0	1
H	8.48	7.81	6.4	5.65	1.41	1	1	0

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	1.support vector 2.margin 3.Hyperplane 4.RBF kernel function 5.Sigmoid kernel function			
c)	Explain issues in a decision tree.		CO3	U
Q.3	**Solve any two questions out of three. (10 marks each)**	**20**		
a)	Explain ensemble learning. Explain Boosting techniques with suitable use case.		CO3	U
b)	Explain Hidden Markov model. Explain its application in the agriculture domain.		CO4	U
c)	Consider the data points A(1,1),B(1,2),C(3,2),D(3,3),E(6,6)),F(6,7),G(7,6),H(7,7) . Apply graph based clustering with minimal spanning tree.		CO5	Ap
Q.4	**Solve any two questions out of three. (10 marks each)**	**20**		
a)	Define machine learning. Consider the use case of the house price prediction. The dataset comprises the area of the house (Sq ft.) and price of the house. Explain steps to design a machine learning solution for the above use case.(7 mk). Describe the issues while design this solution. (3mk)		CO1	U
b)	i. Explain regression and its types (5 mk) ii.Consider the following table and compute Mean Absolute Error, Mean Squared Error and Root Mean Squared Error. (5 mk)		CO2	Ap
c)	i. Differentiate between PCA and LDA (5mk) ii. Describe the working of Singular value decomposition wrf to dimensionality reduction. (5mk)		CO6	U

Actual Value	Predicted value
100	130
150	170
200	220
250	260
300	325

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