Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

VII SEMESTER B.TECH. (INFORMATION TECHNOLOGY | COMPUTER AND COMMUNICATION TECHNOLOGY)

END SEMESTER EXAMINATIONS, DECEMBER 2021 – JANUARY 2022

SUBJECT: PATTERN RECOGNITION [ICT 4053]

REVISED CREDIT SYSTEM
(17/12/2021)

TIME: 75 MINS. **MAX. MARKS: 20**

Instructions to candidates
- Answer **ALL** questions.
- Missing data, if any, may be suitably assumed.

Q. No.	Questions	M*	C*	A*	B*
1A.	Given the following data elements for 2 class problem {(7.1, 4.2), (-1.4,-4.3), (4.5,0), (6.3, 1.6), (4.2, 1.9), (1.4, -3.2), (2.4, -4), (2.5, -6.1), (8.4, 3.7), (4.1, -2.2) } belongs to class omega1 { (-3,-2.9), (0.5,8.7), (2.9, 2.1), (-0.1,5.2), (-4,2.2), (-1.3, 3.7), (-3.4,6.2), (-4.1, 3.4), (-5.1, 1.6), (1.9,5.1)} belongs to class omega2 If W^T_0= [-5, 0.9, 1] and η =0.3, Calculate the weight vector at the end of second iteration using perceptron criteria	5	1	2	4
1B.	Given three classes and discriminant functions as follows: $G_1(X)=X_1 – 2X_2 -15$ $G_2(X)= 3X_1 - X_2 -15$ $G_3(X) = X_1+4X_2-15$ Locate the class for data point (0,3)	3	1	2	3
1C.	Suggest a solution when exhaustive search for clustering becomes completely infeasible?	2	1	1	3
2A.	Explain the Hidden Markov Model and determine the state transition probability of the spoken word “later” and “alter”, i.e. P(later/θ) and P(alter/θ)	5	3	2	5
2B.	Explain the working of K Nearest Neighbor algorithm with an example and justify its application.	3	2	3	3
2C.	Illustrate an example of reducing a 2D-graph to a 1D-graph, so as to maximize the separability of two categories in Multiple Linear Discriminant analysis.	2	1	1	3

M*--Marks, C*--CLO, A*--AHEP LO, B* Blooms Taxonomy Level