

## SEVENTH SEMESTER BTECH. (E & C) DEGREE END SEMESTER EXAMINATION DECEMBER 2021-JANUARY 2022 SUBJECT: Machine Learning (ECE 4052), Program Elective-III

## TIME: (75+10) minutes

## MAX. MARKS: 20

## Instructions to candidates

- Answer **ALL** questions.
- Missing data may be suitably assumed.

Q. No.	Questions	Marks
1A.	Illustrate logistic regression based classifier and show that it is a linear classifier. Obtain the log-likelihood function for the same.	4
1B.	In a linear regression learning, show that the model parameters are given by, $\hat{\beta} = (X^T X)^{-1} X^T Y$ . Here X denotes the input data matrix and Y is the output vector.	3
1C.	<ul> <li>Write a note on the following subset selection methods. Mention their advantages and disadvantages.</li> <li>(i) Best subset selection</li> <li>(ii) Forward step-wise selection</li> </ul>	3
2A.	How non-separable data are addressed using support vector classifier? Explain. With the help of slack variables, describe the optimization criteria used in support vector classifier.	4
2B.	Explain the Maximum A Posteriori (MAP) parametric estimation method with the help of necessary expressions.	3
2C.	Derive the mapping function for Bayes optimal classifier. Explain the loss function used.	3