BE/Insem./Oct.-595
B.E. (IT) (Semester - I)
MACHINE LEARNING & APPLICATIONS
(2015 Pattern)

Time : 1 Hour]   *[Max. Marks : 30*

Instructions to the candidates :

   1)   *Answer Q.1 or Q.2, Q.3 or Q.4 Q.5 or Q.6.*

   2)   *Neat diagrams must be drawn wherever necessary.*

   3)   *Figures to the right indicate full marks.*

   4)   *Assume Suitable data if necessary.*

Q1) a)   Explain the role of Training data set, Testing data set and Validation data set with suitable example. **[6]**

      b)   Discuss Machine Learning applications in following areas : **[4]**

         i)   Biometrics

         ii)   Medical diagnosis

         iii)   Share market

         iv)   Speech recognition

OR

Q2) a)   Explain subset selection method for dimension reduction. **[6]**

      b)   Differentiate between Supervised and Unsupervised learning. **[4]**

Q3) a)   Consider the following 3-class confusion matrix. **[6]**

Calculate precision and recall per class. Also calculate weighted average precision and recall for classifier.

Predicted		
15	2	3
7	15	8
2	3	45

(Actual)

P.T.O.

b) Prove that : **[4]**

   i)   FPR = 1-TNR

   ii)   FNR= 1-TPR

OR

Q4) a) Explain construction of multi-class classifier. **[6]**

   i)   One Vs All approach

   ii)   One Vs One approach

   iii) Error correcting output codes approach

b) Compare and Contrast SVM and Perceptron. **[4]**

Q5) a) What is multiple linear regression? How will it be different from simple linear regression? **[4]**

b) Consider following data for 5 students. **[6]**

Each Xi (i = 1 to 5) represents the score of ith student in standard X and corresponding Yi (i = 1 to 5) represents the score of ith student in standard XII.

   i)   What linear regression equation best predicts standard XIIth score?

   ii)   Find regression line that fits best for given sample data.

   iii) How to interpret regression equation?

   iv) If a student's score is 80 in std X, then what is his expected score in XII standard?

Student	Score in X standard (Xi)	Score in XII standard (Yi)
1	95	85
2	85	95
3	80	70
4	70	65
5	60	70

Q6) a) Consider following data **[6]**

i) Find values of β0 and β1 w.r.t. linear regression model which best fits given data.

ii) Interpret and explain equation of regression line.

iii) If new person rates " Bahubali-Part-I" as 3 then predict the rating of same person for "Bahubali-Part-II"

Person	Xi = rating for movie "Bahubali-Part-I" by i^{th} person	Yi = rating for movie "Bahubali-Part-II" by i^{th} person
1st	4	3
2nd	2	4
3rd	3	2
4th	5	5
5th	1	3
6th	3	1

b) Define Regularized Regression. What is the need of Regularized Regression? **[4]**

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