Total No. of Questions : 6]

SEAT No. :

P5793

[Total No. of Pages : 3

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		
Actual	15	2	3
	7	15	8
	2	3	45

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 i^{th} student in standard X and corresponding Yi (i = 1 to 5) represents the score of i^{th} student in standard XII.

i) What linear regression equation best predicts standard XII^{th} 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

OR

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
1^{st}	4	3
2^{nd}	2	4
3^{rd}	3	2
4^{th}	5	5
5^{th}	1	3
6^{th}	3	1

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