

UID No: \_\_\_\_\_

Paper ID: \_\_\_\_\_

Course: BE-CSE/IT	Semester: 7 <sup>th</sup>
Sub.: Machine Learning	Sub. Code: CSA & ITA-401
Time Allowed: 3 Hours	Maximum Marks : 60

Note: 1. Attempt six questions only. All questions carry 10 marks.

2. Question no. 1 is compulsory with 5 short questions.

(Answer to each part should be between 50-60 words)

3. Attempt five questions from Sections- B, C & D, but not more than two questions from each sections.

(Each Answer should be between 250-300 words)

#### Section - A (Compulsory)

(5X2=10)

- Q.1 (a) Describe linearly In separable problem with example.
- (b) After analyzing the model, your manager has informed that your regression model is suffering from multicollinearity. How would you check if he's true? Without losing any information, can you still build a better model?
- (c) A graph is said to be k-connected if there does not exist a set of k-1 vertices whose removal disconnects the graph. If we define clusters as comprising of K-connected components of the thresholded graphs, does this result in a well-defined clustering algorithm?
- (d) Which one would you prefer to choose – model accuracy or model performance? Reason
- (e) Inspect thoroughly Ariori Algorithm.

#### Section - B

(10 Marks Each)

- Q.2 A sample of 5 persons with hypertension underwent a special blood-pressure-reducing treatment program which resulted in the following reductions in systolic blood pressure for these persons (i.e. the scores give SBP after treatment - SBP before treatment): -5, 10, 20, 5, 10. Derive the mean for this sample.

- Q.3 Scrutinize the Linearly Separable Functions and their significance in machine learning.

- Q.4 Demonstrate the lasso and ridge regression and describe the selection criteria for choosing one of them.

#### Section - C

(10 Marks Each)

- Q.5 State True or False "Because Decision Trees Learn to classify discrete-valued outputs instead of real valued functions it is impossible for them to over fit."
- Q.6 Outline the Networks Equivalent to Decision Trees. Explain Over fitting and Evaluation with example.
- Q.7 Explain:  
a) Inspect closely and thoroughly steps in Back propagation algorithm? Why a Multilayer neural network is required? 10 b) How to estimate difference in error between two hypotheses using error D(h) and error S(h)?

#### Section - D

(10 Marks Each)

- Q.8 Examine density based clustering of application with noise using an example.
- Q.9 Demonstrate the Partial least square regression and principal component regression with methods. How they are different from each other?
- Q.10 Inspect closely and thoroughly:  
1.) Principal Component Analysis (PCA)  
2.) K-MEAN  
3.) Statistical learning

BE-CSE-IT-3<sup>rd</sup>  
5<sup>th</sup>, 7<sup>th</sup> Sem.