Reg. No._____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

SECOND SEMESTER MCA DEGREE EXAMINATION AUG 2017

Course Code**: RLMCA208**

Course Name**: INTRODUCTION TO MACHINE LEARNING**

Max. Marks:60 Duration: 3 Hours

PART A

Answer All Questions. Each question carries 3 marks

1. How do you choose the best split based on the decision tree algorithm?
2. What is meant by ordinary least square estimation?
3. What is the role of the activation function in a neural network?
4. What is the difference between deep learning and machine learning?
5. How do you choose the maximum margin hyperplane?
6. Write a short note on multiclass SVM.
7. What are the advantages of K-fold cross validation?
8. Discuss the strength and weakness of Random forest.

PART B

Answer all questions. Each question carries 6 marks

9.

i. How do machines learn? (3)

ii. What are the steps required for selecting the right machine learning algorithm? (3)

OR

10.

i. How do you find a five number summary? (3)

ii. What are the applications of Principal Component Analysis? (3)

11. The data obtained from a blotting paper testing instrument with two attributes water absorptiveness strength and tearing strength is used to classify whether a blotting paper is good or bad. Four training samples are given here.

X [water absorptiveness strength]	Y [tearing strength]	Z [Classification]
7	7	GOOD
7	4	GOOD
3	4	BAD
1	4	BAD

Now the factory produces a new blotting paper that pass the test with x value 3 and Y value 7. Find the classification of this new blotting paper from the data of trained samples using kNN algorithm.

OR

12. Write a note on Bayes theorem and illustrate maximum likelihood method for predicting probabilities in Bayesian learning with an example.
13. How trees and rules "greedily" partition data into interesting segments? Illustrate with an example

OR

14. Write the difference between simple linear regression and multiple linear regression with examples.
15. How does a Perceptron learn the appropriate weights using delta rule?

OR

16.

i. What are the characteristics of neural networks? (3)

ii. Explain the different types of ANN. (3)

17. What are the key terminologies for Support Vector Machine?

OR

18. How SVM handles non- linearly separable data.

19. Consider the confusion matrix given below for a binary classifier predicting the presence of a disease

	Predicted NO	**Predicted YES**
Actual NO	45	5
Actual YES	5	95

The classifier made a total of 150 predictions Out of those 150 cases, the classifier predicted "yes" 100 times, and "no" 50 times. In reality, 100 patients in the sample have the disease, and 50 patients do not. Calculate the following terms from the given confusion matrix.

1. Precision
2. Recall
3. Accuracy

OR

20.

i. Explain the ensemble approach for the different processes involved in with a neat sketch. (3)

ii. Compare the ensemble based methods bagging and boosting (3)

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