

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
SEVENTH SEMESTER B.TECH DEGREE EXAMINATION(S), MAY 2019

Course Code: EC467

Course Name: PATTERN RECOGNITION

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks.

Marks

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|---|--|------|
| 1 | a) Explain Bayes decision rule. Explain how it can be used for two class classification. | (5) |
| | b) In a town it was estimated that 3% of people have a particular disease. A diagnosis test was conducted for all the people, which yielded 8% false positive and 92% true positive results. A person is found as positive after the test. What is the probability that this person is truly having the disease? | (5) |
| | c) Explain curse of dimensionality. State the significance in pattern recognition problems. | (5) |
| 2 | a) Describe the design principles of pattern recognition system with an example | (5) |
| | b) Assuming a Gaussian distribution of the features, Explain the general principle of the maximum likelihood estimation for the following cases | (10) |
| | 1. Unknown mean and known covariance matrix | |
| | 2. Unknown mean and unknown covariance matrix | |
| 3 | a) Give the expression of a multi-variate Gaussian distribution explaining all parameters | (5) |
| | b) Write a note on first order Hidden Markov Models. How is a Hidden Markov Model different from a Markov model? | (10) |

PART B

Answer any two full questions, each carries 15 marks.

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| 4 | a) Compare parametric and non parametric methods for probability density function estimation | (7) |
| | b) Explain the perceptron learning algorithm in detail | (8) |
| 5 | a) Explain Parzen window method. | (10) |
| | b) How can we identify the decision planes using support vector machine? | (5) |
| 6 | a) What do you mean by linearly separable classification problem? Give examples | (7) |
| | b) With an example explain decision tree for pattern classification. | (8) |

PART C

Answer any two full questions, each carries 20 marks.

- 7 a) Describe the architecture and learning algorithm of back propagation networks. (10)
List its limitations.
- b) Explain K means clustering algorithm. (10)
- 8 a) Explain the Adaboost algorithm. Mention its advantages. (10)
- b) Explain the types of hierarchical clustering (10)
- 9 a) Draw the model of a single artificial neuron (5)
- b) Define the terms: weights, bias, activations with respect to neural networks (5)
- c) Explain the scattering criteria for clustering? (10)
