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FIFTH SEMESTER **B.Tech. (ALL)**

**MID SEMESTER EXAMINATION** September-2019

**IT-307 PATTERN RECOGNTION**

*Time: 1 Hour and 30 Minutes* *Max. Marks: 20*

Note: Answer *ALL* questions.
Assume suitable missing data, if any.

**Question No. 1** [4]

Explain the role of Feature Extraction and Feature Selection in the optimal design of Pattern recognition systems. Does the feature selection further influences the type of classifier preferred for Pattern recognition? Give proper justification to your answer with a few examples.

**Question No. 2** [4]

Let "X" be the continuous random variable with following PDF:-

$f(x) = \begin{cases} Kx & for\ < 0\ x < 1 \\ 0 & otherwise \end{cases}$, Where K is constant.

[a] Determine the value of K and Sketch $f_x(x)$.
[b] Find and Sketch the corresponding CDF $F_{\bar{x}}(x)$.
[c] Find P ( 0.25 < x < 2 )

**Question No. 3** [4]

Describe the mathematical analysis of Bayes Decision Theory and state the classification rule for Two Class Classifier. Plot the two regions of Bayesian classifier for the case of two equi-probable classes and give your comments.

**Question No. 4** [4]

Consider two weak students in programming, who writes a program and their chance of writing a correct program are 1/8 and 1/12. If the probability of making a common error is 1/10001 and they obtain the same answer, find the chance that their program is correct.

**Question No. 5** [4]

Let "X" be a uniformly distributed random variable over the interval 'a' to 'b'. Evaluate the following:-

[a] Mean of random variable "X".
[b] Mean Square value of random variable "X".
[c] The variance of random variable "X".