B.E. Eighth Semester (Computer Science & Engineering) (C.B.S.)
Elective - III : Pattern Recognition

P. Pages : 2

Time : Three Hours

|| *0347* ||

Max. Marks :80

_____

Notes : 1. Solve Question 1 OR Questions No. 2.
2. Solve Question 3 OR Questions No. 4.
3. Solve Question 5 OR Questions No. 6.
4. Solve Question 7 OR Questions No. 8.
5. Solve Question 9 OR Questions No. 10.
6. Solve Question 11 OR Questions No. 12.
7. Due credit will be given to neatness and adequate dimensions.
8. Assume suitable data whenever necessary.
9. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) What is Pattern Recognition? Explain design Principles of Pattern recognition with an example. **7**

   b) Explain the Application of pattern recognition. **6**

OR

2. a) Explain the design cycle of pattern recognition. **7**

   b) Explain the following types of learning. **6**
   i) Supervised learning.
   ii) Unsupervised learning.
   iii) Reinforcement learning.

3. a) Explain Joint distribution and densities of probability. **7**

   b) Prove that $E(z) = E(ax + by) = a E(x) + b E(y)$ for both discrete and continuous care. **6**

OR

4. a) A classifier has 30 Percent error rate. What is the probability that exactly three errors will be made in classifying 10 samples? **7**

   b) Which are the Parameters to estimate from samples? explain. **6**

5. a) Explain Bayes' Decision theory. **7**

   b) Find $P(A / x = 0, y = 0, z = 1)$ given $P(A) = 1/5,$ **7**
   $P(B) = 4/5 \,\&$

   $P(X = 0/A) = \frac{1}{3} \quad P(x = 0/B) = \frac{1}{4},$

   $P(Y = 0/A) = \frac{1}{5} \quad P(Y = 0/B) = \frac{1}{5}$

   $P(Z = 1/A) = \frac{1}{6} \quad P(Z = 1/B) = \frac{1}{7}$

   State your assumption.

OR

www.solveout.in

6.	a)	How we estimates the Errors rates? Explain.	**7**
	b)	For class A feature X is normally distributed with $\mu = 1$ & $\sigma = 2$. for class B. X is uniformly distributed in the range 0 to 4. The prior probabilities are $P(A) = \dfrac{1}{3}$ and $P(B) = \dfrac{2}{3}$ what is the probability that a samples X=3 belongs to class A & B.	**7**
7.	a)	Explain Hidden Markov model.	**7**
	b)	Explain ANN back propogation algorithm in details.	**7**

<div align="center">

OR

</div>

8.	a)	Explain Support vector Machine. How it is trained. How XOR operation is implemented using SVM.	**7**
	b)	Explain FUJJY bared classifier.	**7**
9.	a)	Explain kernel and window Estimator be used in non parametric decision making?	**6**
	b)	What is the Adaptive Decision. Boundaries? Explain.	**7**

<div align="center">

OR

</div>

10.	a)	Find the decision regions resulting from three discriminant function.	**6**

$$D_A = 1 + x + y$$
$$D_B = 2 - x - 2y$$
$$D_C = -3 - 2x + 4y.$$

	b)	What is Histogram? Explain.	**7**
11.	a)	Explain Hierarchical clustering in detail.	**13**

<div align="center">

OR

</div>

12.		Explain Partitional clustering in detail.	**13**

<div align="center">

****

</div>

2