



- 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 are the various components of pattern recognition system? 7
- b) Explain various application of pattern recognition. 6

**OR**

2. a) Explain the different modes of pattern recognition system. 7
- b) Define the following terms. 6
- i) Features
  - ii) Classes
  - iii) Samples
3. a) Explain classification using distance function. 7
- b) Describe the approach of estimation using bayesian classifier. 6

**OR**

4. a) What is pattern classifier? Explain minimum distance for Bayes classifier. 7
- b) Explain maximum like hood Estimation. 6
5. a) Explain C means Algorithm in detail. 7
- b) What is clustering? Explain unsupervised learning in clustering. 7

**OR**

6. a) Write in detail about graph theoretic approach to pattern clustering. 7

- b) Perform a hierarchical clustering using wards method on the data from table. 7

	X	Y
1	4	4
2	8	4
3	15	8
4	24	4
5	24	12

7. a) What are the different elements of formal grammars in structural pattern? 7  
b) Explain the representation of structure in pattern recognition. 6

**OR**

8. a) Explain KL Transform for feature Extraction. 7  
b) What is role of Binary selection in feature Extraction? 6
9. a) Explain Hidden Markov model. 7  
b) Explain classification of Hidden Markov model. 7

**OR**

10. a) What is role of feature selection in support vector machine? 7  
b) Explain state machine in Hidden Markov model. 7
11. a) Explain pattern classification using genetic algorithm. 7  
b) Explain Fuzzy pattern classifier. 6

**OR**

12. a) Explain any one case study on fuzzy pattern classifier & perception. 13

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