



- 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) Explain overview of pattern recognition system. 7  
 b) Explain various application of pattern recognition system. 6
- OR**
2. a) What parameters are required to estimate in pattern classification? Why? Explain maximum likelihood estimation. 8  
 b) Explain supervised & unsupervised learning with example. 5
3. a) Explain Baye's theorem in detail. 7  
 b) Explain minimum distance classifier with example. 6
- OR**
4. a) Explain how patterns are classified using distance function. 6  
 b) What are Bayesian parameters? Explain how Bayesian parameters are estimated. 7
5. a) Perform the divisive hierarchical clustering for the pattern given below. 8  
 A(0.5, 0.5), B(2, 1.5), C(2, 0.5), D(5, 1), E(5.75, 1), F(5, 3), G(5.5, 3), H(2, 3).  
 b) Explain FCMA (Fuzzy c-mean algorithm) in detail. 6
- OR**
6. a) How pattern clustering is performed using graph theoretic approach? 7  
 b) Explain how validity of clusters are performed. 7
7. a) Explain Karhunen – Loeve transform in detail. 7  
 b) Explain various elements of formal grammar. 6
- OR**
8. a) Explain in detail the stochastic grammar. 6  
 b) How features are selected using functional approximation? Explain. 7
9. Explain Hidden Marker Model in detail. 13
- OR**
10. Explain support vector Machine in detail. 13
  11. Explain pattern classification using genetic algorithm. 14
- OR**
12. Write short notes on **any two**. 14  
 i) Fuzzy logic.      ii) Fuzzy pattern classifier.      iii) Fuzzy logic Vs Crisp logic.

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