RVK/KW/13/3408

Faculty of Engineering & Technology

Eighth Semester B.E. (Information Tech.) Examination

PATTERN RECOGNITION

Elective – II

Sections—A & B

Time—Three Hours] [Maximum Marks—80

INSTRUCTIONS TO CANDIDATES

(1) All questions carry marks as indicated.

(2) Answer **THREE** questions from Section A and **THREE** questions from Section B.

(3) Due credit will be given to neatness and adequate dimensions.

(4) Assume suitable data wherever necessary.

(5) Illustrate your answers wherever necessary with the help of neat sketches.

SECTION–A

1. (a) What is pattern recognition ? Explain design principles of pattern recognition with an example. 7

   (b) Write short notes on following :

   (i) Learning and Adaptation

   (ii) Pattern Recognition Approaches. 6

2. (a) Explain Binomial distribution. 4

   (b) Write a note on Poisson Distribution. 4

   (c) Prove that :

   $$E(z) = E(ax + by) = a\,E(x) + bE(y).$$ 5

3. (a) Give the proof for finding the optimal decision boundaries by using Baye's theorem. 8

   (b) Explain different nearest neighbour Classification Techniques. 6

4. (a) Explain model based estimation techniques for evaluating error rate. 7

   (b) Explain fractional counting technique for evaluating error rate. 6

5. (a) State the steps in adaptive decision boundary algorithm. 10

   (b) Write a note on k-nearest neighbour technique. 3

SECTION–B

6. (a) Explain the following criteria :

   (i) The sum of squared error criteria.

   (ii) Related minimum variance criteria. 8

   (b) Write a note on adaptive discriminant function. 5

7. Write a note on hierarchical clustering algorithm. 14

8. Explain partitional clustering algorithm. 13

9. (a) What is image histogram ? Explain image histogram equalization technique for image enhancement. 7

   (b) Write a note on template matching. 6

10. (a) Write a note on geometric image scaling and interpolation. 8

    (b) Write a note on logarithmic grey level scaling. 5