**Registration No.:** | | | | | | | | | | |

**Total Number of Pages: 01** **Course: M.Sc.I**

**Sub_Code: FBEF1012**

**10th Semester Regular Examination: 2024-25**

**SUBJECT: PATTERN ANALYSIS**

**BRANCH(S): M.Sc.I(MC)**

**Time: 3 Hours**

**Max Marks: 70**

**Q.Code: S020**

**Answer Question No.1 (Part-I) which is compulsory, any five from rest (Part-II)**

**The figures in the right hand margin indicate marks.**



**Part-I**

**Q1** **Answer the following questions:** **(2 x 10)**

**a)** What are the two 2 types of supervised learning?

**b)** What is a classifier in Bayesian Decision Theory?

**c)** Define Reinforcement learning.

**d)** What are the different types of least squares method?

**e)** What is the difference between RMSE and MSE?

**f)** Define Moment-based features Fractals?

**g)** What are the 3 types of linear transformations?

**h)** Illustrate the Hadamard transform?

**i)** Describe Fractal dimension. Define fractal dimension in simple terms.

**j)** Define optimal path searching techniques?

**Part-II**

**Long Answer Type Questions (Answer Any five)**

**Q2** **a)** What is the difference between Supervised and. Unsupervised pattern recognition? **(5 + 5)**

**b)** Describe it in detail based on Bayes Decision Theory?

**Q3** Write short notes on the following: **(5 + 5)**

a. Feature Selection Preprocessing

b. Statistical hypothesis testing

**Q4** **a)** What is the discrete Fourier transform (DFT) of a sequence? How it is different from linear transformations? **(5 + 5)**

**b)** What is the purpose of the discrete Fourier transform? Describe how it is different from Hadamard and DTWT?

**Q5** **a)** Demonstrate the Discrete Time Wavelet transform (DTWT) Fourier feature, Write its advantage over other transformation? **(5 + 5)**

**b)** Describe different methods for templating based on optimal path searching techniques?

**Q6** **a)** Mentions types of Fractals? Write about Moment-based features Fractals? **(5 + 5)**

**b)** What is fractal dimension? Explain in detail.

**Q7** **a)** Which algorithm is used for hierarchical clustering and why? **(5 + 5)**

**b)** Describe Clustering Sequential algorithms in analysis.

**Q8** **a)** What is the agglomeration method? **(5 + 5)**

**b)** Describe in detail about agglomeration method.