JADAVPUR UNIVERSITY

B. E. (C.S.E.) 4TH YEAR 2ND SEMESTER EXAMINATION 2022

BIOMETRIC SYSTEMS

Time: Four Hours

Full Marks: 70

[Answer all parts of a question together]

Answer Q1: [20 marks]

1. Define a biometric recognition system. Give some examples of physiological and behavioural characteristics. With a schematic diagram discuss the various steps of a generic biometric system.

Answer either Q2 or Q3: [15 marks]

2. What are the characteristics that a biometric trait should have? Define (i) recognition rate, (ii) false non-match rate, (iii) false match rate and (iv) ROC curve.

3. Why is face considered as common biometric trait? What are the challenges in a face recognition system? Discuss the steps for building a face recognition system.

Answer any one from the following Q4-Q5: [15 marks]

4. Describe how the features extraction is done using the principal component analysis (PCA) and Fisher's linear discriminant analysis (FLDA) w.r.t. face recognition. Discuss their disadvantages.

5. Write short notes on (i) Scale invariant feature transform (SIFT) and (ii) Local binary patterns (LBP).

Answer either Q6 or Q7: [20 marks]

6. What is an artificial neural network (ANN)? What is meant by training process of an ANN? Discuss error-correcting learning rule in an ANN.

7. State the functions of an RBF neural network. Write a training procedure of an RBF neural network with K hidden layer neurons and C output layer neurons using N training samples of p dimension.