

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – SUMMER 2024****Subject Code: 3171613****Date:01-06-2024****Subject Name: Pattern Recognition****Time:02:30 PM TO 05:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

MARKS

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|------------|---|-----------|
| Q.1 | (a) Explain joint and conditional probability with example. | 03 |
| | (b) What is feature vector? Explain with example. | 04 |
| | (c) What is eigen values and eigen vectors? Find eigen values and eigen vectors for matrix $A = \begin{bmatrix} 2 & 5 \\ 4 & 7 \end{bmatrix}$. | 07 |
| Q.2 | (a) Explain mean and variance calculation for variable. | 03 |
| | (b) Explain bayes decision theory for two class and single feature problem/product. | 04 |
| | (c) Derive equation for minimum error classifier. | 07 |
| | OR | |
| | (c) Shows various type projections of probability density function according to different values of variances for two feature classification. | 07 |
| Q.3 | (a) What is features dimensionality reduction? | 03 |
| | (b) Explain role of PCA in image face recognition. | 04 |
| | (c) Write a short note on PCA. | 07 |
| | OR | |
| Q.3 | (a) What is difference between markov model and hidden markov model. | 03 |
| | (b) Draw first order markov model for weather prediction application. | 04 |
| | (c) What is unsupervised learning? What is soft clustering and hard clustering? | 07 |
| Q.4 | (a) What is perceptron ? | 03 |
| | (b) Explain feed forward neural network. | 04 |
| | (c) Write short note on K nearest neighbor algorithm. | 07 |
| | OR | |
| Q.4 | (a) What is back propagation in ANN. | 03 |
| | (b) What is nominal data? | 04 |
| | (c) Write a short note on K mean algorithm. | 07 |
| Q.5 | (a) What is support vector? | 03 |
| | (b) Explain RNN functioning. | 04 |
| | (c) Write a short note on CNN. | 07 |
| | OR | |
| Q.5 | (a) What is deep neural network? | 03 |
| | (b) Explain LSTM functioning. | 04 |
| | (c) Write a short note on CART. | 07 |
