

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

## GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2023

Subject Code:3171617

Date:01-12-2023

Subject Name: Applied Machine Learning

Time: 10:30 AM TO 01:00 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.
5. Z-Table is permitted.

- Q.1** (a) Define machine learning. Enlist and explain at least 4 applications of machine learning in brief. **03**
- (b) Define the terms: **04**  
i) Sample space ii) Random variable iii) Probability iv) Event
- (c) Explain monte-carlo approximation in detail with suitable example. **07**
- Q.2** (a) Explain Bayes' theorem with suitable example. **03**
- (b) Suppose the amount of time it takes to assemble a plastic module ranges from 27 to 39 seconds and that assembly times are uniformly distributed. Describe the distribution. What is the probability that a given assembly will take between 30 and 35 seconds? Fewer than 30 seconds? **04**
- (c) Write short note on Hypothesis testing. **07**
- OR**
- (c) Write a short note on sampling distribution. **07**
- Q.3** (a) Differentiate: Classification and Regression **03**
- (b) What is the probability of obtaining a score greater than 700 on a GMAT test that has a mean of 494 and a standard deviation of 100? Assume GMAT scores are normally distributed. **04**
- (c) Explain logistic regression with suitable example. **07**
- OR**
- Q.3** (a) Enlist and explain the factors determining the effectiveness of SVM. **03**
- (b) If 10% of a population of parts is defective, what is the probability of randomly selecting 80 parts and finding that 12 or more parts are defective? **04**
- (c) Explain multiple linear regression with suitable example. **07**
- Q.4** (a) Define clustering. Enlist the properties of clustering. **03**
- (b) Write a short note on Naïve Bayes classifier. **04**
- (c) Enlist and explain in detail the factors influencing Backpropagation training. **07**

**OR**

- Q.4** (a) Define association rule learning. Enlist the association rule mining algorithms. **03**
- (b) Differentiate: Supervised Learning and Unsupervised Learning **04**
- (c) i) Explain regularization in Neural Network with suitable example. **07**  
ii) Explain optimization in Neural Network with suitable example.
- Q.5** (a) Explain Maximum Likelihood Estimation (MLE) in detail. **03**
- (b) Write the role of Generative Adversarial Network (GAN). Explain GAN structure in detail. **04**
- (c) Write short note on Multi-layer perceptron. **07**
- OR**
- Q.5** (a) Explain Maximum A Posterior (MAP) in detail. **03**
- (b) Write short note on Deep Reinforcement Learning. **04**
- (c) Write short note on Deep Learning. **07**

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