Register No.: ..... Name.: .....

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

SECOND SEMESTER MBA DEGREE EXAMINATION (S), AUGUST 2023
(2021 Scheme)

Course Code : 21MBA114

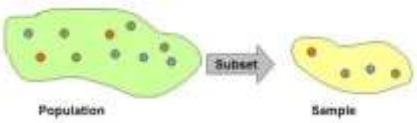
Course Name: Business Analytics

Max. Marks : 60 **Duration: 3 Hours**

PART A

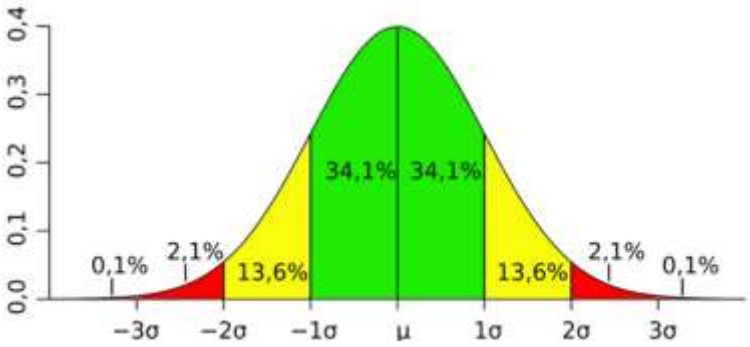
(Answer all questions. Each question carries 2 marks)

1. How is predictive analytics different from prescriptive? Mention one modeling technique under each category .
2. (a) Comment on the below image: Keeping in mind the major types of Statistics available for data analysis.



(b) Which measurement scale should we use to categorize a fruit?

3. Interpret the following figure:



4. When is logistic regression modelling used? Elucidate with an example.
5. Recall any four assumptions of LPP.

PART B

(Answer any 3 questions. Each question carries 10 marks)

6. Data is the new oil. Comment this statement in the view of how business analytics leads to data driven decision making.

7. The number of employees in two garment factories Factory-1 and Factory-2 are 100 and 200 respectively. The average wages per employee and variance of the wage per employee for these factories are given below:

Component	**Factory -1**	**Factory-2**
Average wage per employee (Rs.)	5000	8000
Variance of wages per employee	6000	10000

Which factory has more uniform wages? Why do you think so?

8. Identify with suitable examples, the business situations when time series analysis and multiple linear regression are best suited.

9. Esteem Productions Pvt. Ltd. is a manufacturing firm which has three production factories F1, F2 and F3 supplying its products to four retail outlets R1, R2, R3 and R4. The requirement at each retail outlet, capacities of the factories and unit shipping costs from factories to respective retail outlets are given in the matrix below:

	R1	R2	R3	R4	Supply
F1	6	1	9	3	70
F2	11	5	2	8	55
F3	10	12	4	7	70
Demand	85	35	50	45	215 195

a) Choose the best mathematical model suited to optimize the total shipping cost.

(2 marks)

b) Is this a balanced or unbalanced problem? If it is unbalanced, how to convert it into a balanced problem?

(5 marks)

c) What is the difference between feasible and optimal solution?

(3 marks)

10. Assume that a factory has two machines. Past records show that machine 1 produces 30% of the items of output and machine 2 produces 70% of the items. Further, 5% of the items produced by machine 1 were defective and only 1% produced by machine 2 were defective. If the defective item is drawn at random, what is the probability that the defective item was produced by machine 1. (7)
While calculation clearly mention which are marginal, conditional probabilities and joint probabilities. (3)

PART C

(Compulsory question, the question carries 20 marks)

11. A firm that makes products X and Y has a total production capacity of 9 tonnes per day, X and Y requiring the same production capacity. The firm has a permanent contract to supply at least 2 tonnes of X and 3 tonnes of Y per day to another company. Each one of X requires 20 machine hrs. production time and Y requires 50 machine hrs production time. The daily maximum possible number of machine hours available is 360. All the firm's output can be sold, and the profit set is ` 80 per tonne of X and ` 120 per tonne of Y.
    (a) Identify the best optimization model suited for this case. Clearly mention the components of model. Marks (5)
    (b) You are required to formulate the mathematical model to determine the production schedule to maximize the firm's profit. Marks (15)

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