

Register No.: Name.:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

FIRST SEMESTER MBA DEGREE EXAMINATION (S), MAY 2022

(2021 Scheme)

Course Code : 21MBA103

Course Name: QUANTITATIVE TECHNIQUES FOR MANAGERS

Max. Marks : 60

Duration: 3 Hours

PART A

(Answer all questions. Each question carries 2 marks)

1. Summarize the concurrent deviation method.
2. Explain the terms Type 1 error and Type 2 error.
3. Illustrate the concept 'Ogives'.
4. Explain the Bayes' Theorem.
5. The following data represent total revenues (in \$millions) for a fast-food store over the 11-year period 2002 to 2012:

4	5	7	6	8	9	5	7	7.5	5.5	6.5
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Compute the 3-year moving averages for this annual time series

PART B

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

6. An insurance company has the business objective of reducing the amount of time it takes to approve applications for life insurance. the approval process consists of underwriting, which includes a review of the application, a medical information bureau check, possible requests for additional medical information and medical exams, and a policy compilation stage in which the policy pages are generated and sent for delivery. the ability to deliver approved policies to customers in a timely manner is critical to the profitability of this service. During a period of one month, a random sample of 10 approved policies is selected, and the total processing time, in days, is collected. these data are:

73 19 16 64 28 28 31 90 60 56

In the past, the mean processing time was 45 days. At the 0.05 level of significance, is there evidence that the mean processing time has changed from 45 days? (Critical Value= 2.262) Discuss.

7. Weekly demand at a grocery store for a brand of breakfast cereal is normally distributed with a mean of 800 boxes and a standard deviation of 75 boxes. What is the probability that weekly demand is 959 boxes or less? Determine the probability that weekly demand is greater than 950 boxes?
8. The marketing manager of a large supermarket chain has the business objective of using shelf space most efficiently. toward that goal, she would like to use shelf space to predict

the sales of a specialty pet food. Data are collected from a random sample of 10 equalized stores, with the following result. Develop the regression equation and interpret the result

Store	Shelf Space (X)(square feet)	Weekly Sales (Y)(\$)
1	5	160
2	5	220
3	5	140
4	10	190
5	10	240
6	10	260
7	15	230
8	15	270
9	15	280
10	20	260

9. The Vice President of a garment company wants to determine whether the sales of the company's brand of jeans is independent of age group. The market researcher took a random sample of 703 consumers who have purchased the three brands of jeans A, B and C, as follows

Age Group	Brand A	Brand B	Brand C
15-25	65	75	72
25-35	60	40	64
35-45	45	52	50
45-55	55	65	60

Determine whether the brand preference for jeans is independent of age at 5% level of significance.

(10 marks)

10. In many manufacturing processes, the term work-in-process (often abbreviated WIP) is used. In a book manufacturing plant, the WIP represents the time it takes for sheets from a press to be folded, gathered, sewn, tipped on end sheets, and bound. The data represent samples of 10 books at each of two production plants and the processing time (operationally defined as the time, in days, from when the books came off the press to when they were packed in cartons) for these jobs:

Plant A

5.62	5.29	16.25	10.92	11.46	21.62	8.45	8.58	5.41	11.42
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Plant B

9.54	11.46	16.62	12.62	25.75	15.41	14.29	13.13	13.71	10.04
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Which plant shows more variation?

PART C

(Compulsory question, the question carries 20 marks)

11. Suppose the National Transportation Safety Board (NTSB) wants to examine the safety of compact cars, midsize cars, and full-size cars. It collects a sample of six for each of the (cars types).

Compact	Midsize	Full-size
643	469	484
655	427	456
702	525	402
604	462	480
712	470	500
590	500	490

- a) Find the mean and the standard deviation of each of the group Marks (10)
- b) Using the hypothetical data provided, examine whether the mean pressure applied to the driver's head during a crash test is equal for each type of car. Use $\alpha = 5\%$. (Critical value at $\alpha = 5\%$. = 3.68)

Marks (10)
