Roll No											

PRESIDENCY UNIVERSITY
BENGALURU

SET B

SCHOOL OF MANAGEMENT
END TERM EXAMINATION - JAN 2024

Semester : Semester I - 2023
Course Code : MBA1007
Course Name : Business Statistics
Program : MBA

Date : 04-JAN-2024
Time : 10:00AM - 1:00 PM
Max Marks : 100
Weightage : 50%

Instructions:
(i) Read all questions carefully and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and non-programmable calculator are permitted.
(iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS **10 X 3M = 30M**

1. What are the merits of median
(CO1) [Knowledge]

2. Mention the merits of mean
(CO1) [Knowledge]

3. Define a random variable and give an example.
(CO2) [Knowledge]

4. Give examples where the variables are (i) positively correlated (ii) negatively correlated.
(CO2) [Knowledge]

5. Define a discrete random variable and give an example.
(CO3) [Knowledge]

6. What are equally likely events? Provide an example.
(CO3) [Knowledge]

7. Define an event and give an example.
(CO3) [Knowledge]

8. Define random experiment and provide an example.
(CO3) [Knowledge]

9. What are Type I and Type II errors?
(CO4) [Knowledge]

10. What is a null hypothesis? Provide an example

(CO4) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS **6 X 7M = 42M**

11. A research agency administers a demographic survey to 90 telemarketing companies to determine the size of their operations. The agency's analyst organizes the figures into a frequency distribution. Compute standard deviation

Number of Employees Working in Telemarketing	**Number of Companies**
0–under 20	16
20–under 40	19
40–under 60	32
60–under 80	13
80–under 100	10

(CO1) [Comprehension]

12. A research agency administers a demographic survey to 90 telemarketing companies to determine the size of their operations. The agency's analyst organizes the figures into a frequency distribution. Compute mean and mode

Number of Employees Working in Telemarketing	**Number of Companies**
0–under 20	16
20–under 40	19
40–under 60	32
60–under 80	13
80–under 100	10

(CO1) [Comprehension]

13. Over a period of a few months, is there a strong correlation between the value of the U.S. dollar and the prime interest rate? The following data represent a sample of these quantities over a period. Compute a Spearman's rank correlation to determine the strength of the relationship between prime interest rates and the value of the dollar**.**

Dollar Value	Prime Rate
92	9.3
88	8.4
96	9.0
84	8.1
91	8.5
81	7.9
89	8.0
83	7.2
93	8.3

(CO2) [Comprehension]

14. In the past few years, outsourcing overseas has become more frequently used than ever before by U.S. companies. However, outsourcing is not without problems. A recent survey by *Purchasing* indicates that 20% of the companies that outsource overseas use a consultant. Suppose 15 companies that outsource overseas are randomly selected.

a. What is the probability that exactly five companies that outsource overseas use a consultant?

b. What is the probability that none of the companies that outsource overseas use a consultant?

(CO3) [Comprehension]

15. The following data are the result of a historical study of the number of flaws found in a porcelain cup produced by a manufacturing firm. Use these data and the associated probabilities to compute the expected number of flaws and the standard deviation of flaws.

Flaws	Probability
0	.461
1	.285
2	.129
3	.087
4	.038

(CO3) [Comprehension]

16. The waiting time to place an order at a branch of a fast-food chain during the lunch hour has had a population mean of 3.55 minutes, with a population standard deviation of 1.1 minutes. Recently, in an effort to reduce the waiting time, the branch has experimented with a system in which there is a single waiting line. A sample of 100 customers during a recent lunch hour was selected, and their mean waiting time to place an order was 3.18 minutes. At the 0.05 level of significance, is there evidence that the population mean waiting time to place an order is less than 3.55 minutes? (table value = -1.65)

(CO4) [Comprehension]

PART C

ANSWER ALL THE QUESTIONS **2 X 14M = 28M**

17. The cost of a previously owned car depends upon factors such as make and model, model year, mileage, condition, and whether the car is purchased from a dealer or from a private seller. To investigate the relationship between the car's mileage and the sales price, data were collected on the mileage and the sale price for 10 private sales of a model year 2020

Miles (1000s) X	**Price ($1000s) Y**
90	7.0
59	7.5
66	6.6
87	7.2
90	7.0
106	5.4
94	6.4
57	7.0
138	5.1
87	7.2

Obtain a regression equation of Yon X

(CO2) [Application]

18. A bank branch located in a commercial district of a city had the business objective of improving the process for serving customers during the noon-to-1:00 P.M. lunch period. The waiting time (defined as the time the customer enters the line until he or she reaches the teller window) of all customers during this hour is recorded over a period of a week. Data were collected from a random sample of 15 customers, and the results are organized (and stored in) as follows: 4.21 5.55 3.02 5.13 4.77 2.34 3.54 3.20 4.50 6.10 0.38 5.12 6.46 6.19 3.79 At the 0.05 level of significance, is there evidence that the population mean waiting time is less than 5 minutes? (table value = -1.761)

(CO4) [Application]