MBA Degree (FT/PT) First Semester University End Semester Examination-January, 2024

21-371-0102/21-372-0102: STATISTICS FOR MANAGERS

(Regular and Supplementary)

Time: 3 Hours

Max. Marks: 50

Course Outcomes: On completion of the course, the student will be able to:-

CO1	Ability to recall the basic concepts and terms related to Statistics and Quantitative Methods
CO2	Ability to understand comprehensively the concepts and to identify the right technique to be applied in a context.
CO3	Gaining knowledge about developing application skills in the business context.
CO4	Impart skills to analyse the real business data to explore and establish relationships in the areas of managerial decisions with an appropriate statistical package.
CO5	Evaluate the practical implications of the results found from the analysis of data.
CO6	Generate new ideas and solutions for business problems. The students based on the evaluation of real data come to statistical conclusions.

BL – Bloom's Taxonomy: *(L1- Remember, L2 - Understand, L3 – Apply, L4-Analyse, L5-Evaluate, L6-Create)*

PART A

(Answer ALL questions. Each question carries 2 marks)

Q. Nos.	Questions	Marks	BL	CO
1	What is Index number? How is it useful in business decisions?	2	1	4
2	Calculate the GM and HM of the following quantities: 3, 6, 24, 48.	2	3	5
3	Explain Type I and Type II error.	2	2	1
4	State Addition and Multiplication theorem of probability	2	1	3
5	What is a chi-square test?	2	2	2

(5X2=10 marks)

PART B

(Answer ANY FIVE Questions. Each question carries 4 marks)

Q. Nos.	Questions	Marks	BL	CO
6	Distinguish between Correlation and Regression Analysis.	4	2	1
7	Discuss (1) Cluster Analysis and (2) Factor Analysis	4 (2+2)	2	3
8	(i) A bag contains 2 white and 3 black balls; another contains 3 white and 2 black balls. A ball is drawn from one of the bags and found to be white. What is the probability that it is from the first bag. (ii) State the area property of the Normal distribution	4 (2+2)	6	5
9	Find the Mean and Standard deviation for the following data: Y: 227, 235, 255, 269, 292, 299, 312, 321, 333, 348	4	4	4

Q. Nos.	Questions	Marks	BL	CO
10	Find the Pearson's Correlation coefficient for the following data: X: 10 14 15 28 35 48 Y: 74 61 50 54 43 26	4	3	2
11	In Kochi, 30% of the workers take public transportation daily. a) In a sample of 10 workers, what is the probability that exactly 3 workers take public transportation daily? b) In a sample of 10 workers, what is the probability that at least 3 workers take public transportation daily?	4	3	5
12	After correcting the proofs of the first 50 pages of a book, it is found that on the average there are 3 errors per 5 pages. Estimate the number of pages with 0, 1, 2, 3 errors in the whole book of 1000 pages. ($e^{-0.6} = 0.5488$)	4	3	2

(5X4=20 marks)

PART C
(Answer ANY TWO questions. Each question carries 10 marks)

Q. Nos.	Questions	Marks	BL	CO
13	The following table gives age in year of cars and annual maintenance cost (M/c) (in hundred rupees). 	M/c	15	18	21	23	22
Age	1	3	5	7	9 | Estimate the maintenance cost for a 4-year old car after finding the appropriate regression equation(s). Also, find coefficient of determination and interpret the result	10	5	5
14	(a) A factory was producing electric bulbs of average length of life 2000 hours. A new manufacturing process was developed with the hope of increasing the length of the life of bulbs. Samples of 25 bulbs produced by the new process were examined and the average length of life was found to be 2200 hours. Examine whether the average length of the bulbs was increased assuming the length of life of bulbs follow normal distribution with $\sigma = 300$ (b) First choice is a chain of shopping malls in New Delhi. The business group plans to open one more shopping mall in the city. Based upon the information received from the officials for the housing societies in the vicinity, the mean income per household in that area is ₹60,000. A random sample of 10 households was taken, the average household income was found to be ₹55,000 and the standard deviation came out to be ₹10,000. The business group will establish the mall only if the sample information supports the population information. Give your conclusion at 5% level of significance Given: $Z_{05} = 1.96$; $t_{0.05,9} = 2.262$	10 (5+5)	4	6

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15 (a) A certain drug is claimed to be effective in curing colds. In an experiment on 328 people with cold, half of them were given the drug and half of them were given sugar pills. The patients' reactions to the treatment are recorded in the following table. Test the hypothesis that the drug is no better than sugar pills for curing colds

Treatment	Consequence		
	Helped	Harmed	No effect
Drug	104	20	40
Sugar pills	88	24	52

Given: $\chi^2_{0.05,2} = 5.99$

(b) Compute the Price index by using Fisher's formula from the data given below:

Commodity	2022		2023	
	Price (Rs/Unit)	Expenditure(Rs)	Price (Rs/Unit)	Expenditure (Rs)
A	2	40	5	75
B	4	16	8	40
C	1	10	2	24
D	5	25	10	60

10 (5+5)   6   5

(2x10=20 marks)

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