A–1064

Total Pages : 5 **Roll No. .....**

MS–104

Master of Business Administration (MBA)

(Quantitative Techniques in Management)

1st Semester Examination, 2024 (June)

Time : 2:00 Hrs. Max. Marks : 70

Note* :–** This paper is of Seventy (70) marks divided into Two (02) Sections 'A' and 'B'. Attempt the questions contained in these Sections according to the detailed instructions given therein. ***Candidates should limit their answers to the questions on the given answer sheet. No additional (B) answer sheet will be issued.

Section–A

(Long Answer Type Questions) 2×19=38

***Note* :–** Section 'A' contains Five (05) Long-answer type questions of Nineteen (19) marks each. Learners are required to answer any *two* (02) questions only.

1. Define and compare the measures of central tendency-mean, median, mode, and quartile. Using business-related scenarios, explain situations where each measure would be most appropriate.

2. Compare and contrast Karl Pearson's correlation coefficient and Rank correlation. Explain the significance of correlation in decision-making for businesses.

3. Consider a scenario where a manufacturing company produces light bulbs, and the probability of a bulb being defective is 0.05. The company randomly selects 20 bulbs for quality control :

   (a) Calculate the probability that exactly 2 bulbs are defective.

   (b) Determine the probability of having at least 3 defective bulbs.

   (c) Calculate the mean and standard deviation of the number of defective bulbs in a sample of 20.

4. A company has four factories (A, B, C, and D) producing goods that need to be distributed to four warehouses (W1, W2, W3, and W4). The transportation costs per unit (in dollars) are given in the table below :

Factories	Warehouses			
	W1	**W2**	**W3**	**W4**
A	4	7	6	8
B	5	3	4	6
C	9	2	7	5
D	8	6	3	2

The supply at each factory and the demand at each warehouse are as follows :

Factory A : 80 units

Factory B : 100 units

Factory C : 120 units

Factory D : 60 units

Warehouse W1 : 70 units

Warehouse W2 : 90 units

Warehouse W3 : 80 units

Warehouse W4 : 120 units

Apply the transportation problem approach to find the optimal transportation plan, minimizing the total transportation cost.

5. Examine the concepts of Skewness, Kurtosis, and Moments in statistics, and elucidate their significance in describing the shape and distribution of a dataset. Provide examples to illustrate how these measures contribute to a comprehensive understanding of statistical properties.

Section–B

(Short Answer Type Questions) 4×8=32

***Note* :–** Section 'B' contains Eight (08) Short-answer type questions of Eight (08) marks each. Learners are required to answer any *four* (04) questions only.

1. Explain the concept of Frequency Distribution in statistics. Provide a step-by-step guide on how to construct a frequency distribution table for a given set of data.

2. Given a dataset with the following values :

   5, 8, 10, 12, and 15, calculate the standard deviation.

3. Explain the key properties of regression coefficients in the context of linear regression. Additionally, discuss the relationship between regression coefficients and correlation coefficients.

4. Explain the concept of time series analysis in statistics. Discuss the primary components of a time series and provide examples of real-world applications where time series analysis is valuable.

5. A box contains 10 red balls and 8 blue balls. If two balls are drawn without replacement, what is the probability of drawing one red ball and one blue ball ?

6. Explain the characteristics of the Normal Distribution and provide an example of a real-world scenario where the Normal Distribution is applicable.

7. Explain the concept of Replacement Theory in operations research. Discuss the key considerations in making replacement decisions.

8. Compare and contrast the advantages and limitations of PERT and CPM. In what scenarios would one technique be more suitable than the other for project management ?

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