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School of Management and Business Studies
Department of Management **Roll No...**
Odd Semester Examination - January 2024
Integrated MBA- Semester VII
Subject Code: MBA (I) FG 108, Subject Name: Quantitative Methods

Duration: 3 Hour

Max.Marks -75

Note: Attempt any Five Questions, All questions carry equal marks (15X5=75)

Q1: Calculate the Coefficient of Variation and Inter-Quartile Range from the following data:

X	21	24	19	14	28	30	32	29	10
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Q2: a. A random sample of size 39 is taken from a population of 200 members. The sample mean is 66 and the population standard deviation is 11. Construct a 96% confidence interval to estimate the population mean. What is the point estimate of the population mean? (Use the following critical values: $Z_{0.05} = \pm 1.96$, $Z_{0.04} = \pm 2.054$)

b. A random sample of 51 items is taken, with $\bar{X}=58.42$ and $s^2=25.68$. Use these data to test the following hypotheses, assuming you want to take only a 1% risk of committing a Type I error and that x is normally distributed. (Use the following critical values: $Z_{0.01} = \pm 2.33$, $Z_{0.10} = \pm 1.28$, $T_{0.01,50} = 2.403$)

$H_0: \mu = 60$

$H_a: \mu < 60$

Q3: What is Run-Test? When do we use Run test? Illustrate small sample run test with the help of an example.

Q4: A company produces two types of products, Product A and Product B. The company has two machines, Machine 1 and Machine 2, and the time (in hours) required to produce each unit of each product on each machine is given below:

Machine 1: Product A: 2 hours Product B: 1 hour

Machine 2: Product A: 1 hour Product B: 3 hours

The company has a total of 60 hours available on Machine 1 and 40 hours available on Machine 2 per week. The profit for each unit of Product A is \$5, and for Product B is \$4.

Formulate a linear programming problem to maximize the profit and find the optimal production quantities for Products A and B.

Q5: An increasing number of consumers believe they have to look out for themselves in the marketplace. According to a survey conducted by the Yankelovich Partners for *USA WEEKEND* magazine, 60% of all consumers have called an 800 or 900 telephone number for information about some product. Suppose a random sample of 25 consumers is contacted and interviewed about their buying habits.

a. What is the probability that 15 or more of these consumers have called an 800 or