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**Department of Management, Jamia Hamdard**

**BBA - II - Semester Examination – 2019**

**Business Statistics BBA-C-05**

Time: 3 Hours.

Maximum Marks: 75

Note: This question paper is divided into two sections, Section A & Section B. Attempt both sections.

**Section – A: Attempt ANY SIX (6) questions. (6x5=30)**

**Q1.** What is standard deviation? Explain it through Empirical Rule.

**Q2.** A sample of 12 small accounting firms reveals the following No. of staff per office.

7 10 9 14 11 8 5 12 8 3 13 6

Determine the interquartile range.

**Q3.** Write a Short Note on Correlation and its types.

**Q4.** Write a Short Note on Time Series Analysis.

**Q5.** Write a Short Note on linear programming.

**Q6.** What is additive Law of Probability? What would be its formula in case of mutually exclusive events?

**Q7.** What is the probability of getting a score between 300 and 600 in the GMAT Exam?

$P(300 < X < 600 \mid \mu = 494 \text{ and } \sigma = 100) = ?$

**Q8.** What do you mean by Hypothesis Testing? How is the two-tailed test different from the one-tailed test?

**Q9.** Write down the mathematical equations for the formulation of below linear programming problem. (Formulation only, Solution not required)

A dietician has to develop a special diet using two foods **P** and **Q**. Each packet (containing 30 g) of food **P** contains 12 units of calcium, 4 units of iron, 6 units of cholesterol and 6 units of vitamin A. Each packet of the same quantity of food **Q** contains 3 units of calcium, 20 units of iron, 4 units of cholesterol and 3 units of vitamin A. The diet requires at least 240 units of calcium, at least 460 units of iron and at most 300 units of cholesterol. How many packets of each food (**P** & **Q**) should be used to minimize the amount of vitamin A in the diet?

**Section – B: Attempt ANY THREE (3) questions. (3x15=45)**

**Q1.** Compute mean, standard deviation and coefficient of variation from the following data:

| Class     | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 |
|-----------|------|-------|-------|-------|-------|-------|-------|-------|
| Frequency | 5    | 10    | 15    | 40    | 30    | 20    | 10    | 5     |

**Q2.** According to a Human Resources report, a worker in the industrial countries spends on average 419 minutes a day on the job. Suppose the standard deviation of time spent on the job is 27 minutes.

a. If the distribution of time spent on the job is approximately bell shaped, between what two times would 99.7% of the figures be?

b. If the shape of the distribution of times is unknown, approximately what percentage of the times would be between 359 and 479 minutes?

**Q3.** Determine the value of the coefficient of correlation,  $r$ , for the following data.

X 158 296 87 110 436

Y 349 510 301 322 550

**Q4.** Determine the equation of the regression line from the following data:

x 12 21 28 8 20

y 17 15 22 19 24

**Q5.** Solve the following linear programming problem using simplex method

Maximize:  $Z = 3x + 5y$

$x \leq 4, 2y \leq 12, 3x + 2y \leq 18, x, y \geq 0$

**Q6.** Figures released by the U.S. Department of Agriculture show that the average size of farms has increased since 1940. In 1940, the mean size of a farm was 174 acres; by 1997, the average size was 469 acres. Between those years, the number of farms decreased but the amount of tillable land remained relatively constant, so now farms are bigger. This trend might be explained, in part, by the inability of small farms to compete with the prices and costs of large-scale operations and to produce a level of income necessary to support the farmers' desired standard of living. Suppose an agribusiness researcher believes the average size of farms has now increased from the 1997 mean figure of 469 acres. To test this notion, she randomly sampled 23 farms across the United States and ascertained the size of each farm from county records. The data she gathered follow. Use a 5% level of significance to test her hypothesis. Assume that number of acres per farm is normally distributed in the population.

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433 545 511 590 561 565