MS-008

MANAGEMENT PROGRAMME
Term-End Examination
June, 2022

MS-008 : QUANTITATIVE ANALYSIS FOR MANAGERIAL APPLICATIONS

Time : 3 hours *Maximum Marks : 100*
(Weightage : 70%)

Note :

  (i) *Section A has **six** questions, each carrying 15 marks. Attempt any **four** questions from this section.*

  (ii) *Section B is **compulsory** and carries 40 marks. Attempt both the questions.*

  (iii) *Use of calculator is permitted.*

SECTION A

1. The daily cost, C_D, of operating a hospital, is a linear function of the number of in-patients, I_P, and out-patients, P, plus a fixed cost, a, i.e.,

    $$C_D = a + bP + dI_P$$

    Given the following data for three days, find the value of a, b and d by setting up a linear system of equations and using the matrix inverse :

Day	Cost (C_D) (in ₹)	No. of in-patients, I_P	No. of out-patients, P
1	6,950	40	10
2	6,725	35	9
3	7,100	40	12

2. Discuss the validity of the following statement :

"A secondary source is not as reliable as a primary source."

3. A highway petrol pump can serve on an average 15 cars per hour. What is the probability that for a particular car, the time taken will be less than 3 minutes ? (The value of $e^{-0.75} = 0.4724$)

4. Why is forecasting so important in business ? Identify applications of forecasting for medium-term decisions.

5. The number of automobile accidents per week that took place during peak traffic hours in a metropolis reported for 10 weeks were 12, 8, 20, 2, 14, 10, 15, 6, 9, 4. Are the frequencies in agreement with the belief that accident conditions were the same during this 10-week period ?

(The value of test-statistic at $\alpha = 0.05$ and df = 9 is 16·92)

6. Write short notes on any ***three*** of the following :

(a) Arithmetic Progression

(b) Census and Sample

(c) Bernoulli Process

(d) Systematic Sampling

(e) Linear Regression

SECTION B

7. In a university, 30 percent of the students doing a course in Statistics use the book authored by A_1, 45 percent use the one authored by A_2, and 25 percent use the one authored by A_3. The proportion of students who learnt about each of these books through their teachers are : $A_1 = 0\cdot50$, $A_2 = 0\cdot30$ and $A_3 = 0\cdot20$. One of the students selected at random revealed that he learnt about the book he is using through his teachers. Find the probabilities that the book used is authored by A_1, A_2 and A_3, respectively.

8. Calculate the correlation of the following data using Karl Pearson's method :

Series A	Series B
112	200
114	190
108	214
124	187
145	170
150	170
119	210
125	190
147	180
150	181

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