

14. (a) Solve the equation by matrix method

$$90x + 100y + 20z = 800$$

$$130x + 50y + 40z = 900$$

$$60x + 100y + 30z = 850$$

(b) Find the inverse of  $A = \begin{bmatrix} 2 & 2 \\ 3 & 5 \end{bmatrix}$ .

**9150/BB2**

**OCTOBER 2009**

**BUSINESS STATISTICS AND MATHEMATICS**

(For those who joined in July 2003 and after)

Time : Three hours

Maximum : 100 marks

**SECTION A — (4 × 10 = 40 marks)**

Answer any FOUR questions.

All questions carry equal marks.

1. What are the uses of statistics?
2. Discuss the principles of sampling.
3. Mention some of the graphs can be drawn from frequency distribution.
4. Compute median

Mid values : 115 125 135 145 155 165 175 185 195

Frequency : 6 25 48 72 116 60 38 22 3

5. Find Q.D.

X: 351-500 501-650 651-800 801-950 951-1100

f: 48 189 88 47 28

6. What are tests of consistency and adequacy of index number?

7. Find Rank correlation

Rank A: 1 6 5 10 3 2 4 9 7 8

Rank B: 3 5 8 4 7 10 2 1 6 9

8. Discuss the methods of forecasting.

SECTION B — (3 × 20 = 60 marks)

Answer any THREE questions.

9. (a) Discuss addition and multiplication theorems of probability.

(b) A coin is tossed 6 times. Find out the probability of getting exactly 3 heads and 3 tails.

10. (a) Explain the methods to fit a normal curve to an observed frequency distribution.

(b) A company expects fixed costs to be Rs. 30,000 and variable cost Rs. 42,000 when the sales will be Rs. 60,000.

(i) Write down the equation relating sales and expenses.

(ii) Find the break even point.

(iii) What will be the profit when the sales is Rs. 1,20,000?

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11. (a) Find  $\frac{dy}{dx}$  if  $y = \frac{x^2 + 1}{x^3} + 8 \log 2x$ .

(b) The total cost function for the production of  $x$  unit of an item is given by  $T = 10 - 4x^3 + 3x^4$  find

(i) The average cost

(ii) The marginal cost

(iii) The marginal average cost.

12. (a) The steel plants produce  $x$  tons of steel per week at a total cost of Rs.  $\left(\frac{1}{3}x^3 - 5x^2 + 99x + 35\right)$ . Find the output level at which the marginal cost attains its minimum.

(b) Explain the various categories of time series.

13. (a) Integrate  $\int \frac{3e^{2x} + 3e^{4x}}{e^x + e^{-x}} dx$ .

(b) If the demand curve is  $P = 20 - 2x$ , where  $p$  and  $x$  respectively the price and the amount demanded of a commodity. Find the consumer's surplus when  $p = 6$  and  $p = 10$ .

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