



MBA(P)I/12.13.1088

MBA (PT) DEGREE I SEMESTER EXAMINATION DECEMBER 2013

SMP 2102 QUANTITATIVE TECHNIQUES
(2012 Admission onwards)

Time: 3 Hours

Maximum Marks: 50

PART A
(Answer *ALL* questions)

(5 × 2 = 10)

Define the following terms:

- I. Kurtosis
- II. Rank correlation
- III. Fisher's index number
- IV. Mutually exclusive events
- V. Scalar matrix

PART B
(Answer *ANY FIVE* questions)

(5 × 4 = 20)

- VI. What are the different methods used for primary data collection?
- VII. What are the advantages of SPSS as a statistical package?
- VIII. For the two sets of observations on variables X and Y respectively, calculate the Karl Pearson's coefficient of correlation.

| | | | | | |
|---|---|----|----|---|---|
| X | 6 | 2 | 10 | 4 | 8 |
| Y | 9 | 11 | 5 | 8 | 7 |

- IX. The data on advertisement expenditure (X) and value of total sales (Y) for a commodity is given below:

| | | | | | | | |
|-------------------------|----|----|----|----|----|----|----|
| Sales (Y) in ₹(crores) | 14 | 16 | 18 | 20 | 24 | 30 | 32 |
| Advertisement (X) | 52 | 62 | 65 | 70 | 76 | 80 | 78 |
| Expenditure in ₹(lakhs) | | | | | | | |

Fit a regression line for the data.

- X. Calculate Fisher's ideal index number for the data given below:

| Commodity | Price | | Quantity | |
|-----------|----------------|----------------|----------------|----------------|
| | P ₀ | P ₁ | Q ₀ | Q ₁ |
| A | 6 | 10 | 50 | 56 |
| B | 2 | 2 | 100 | 120 |
| C | 4 | 6 | 60 | 60 |
| D | 10 | 12 | 30 | 24 |
| E | 8 | 12 | 40 | 36 |

(P.T.O.)

XI. State and prove the addition theorem on probability for any two events A and B.

XII. Given that $A = \begin{bmatrix} 1 & 3 & 2 \\ 0 & 1 & -1 \\ 1 & 2 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 1 & 0 \\ 3 & 2 & 1 \\ -1 & -2 & 3 \end{bmatrix}$

Find $2A + 3B$.

PART C
(Answer *ANY TWO* questions)

(2 x 10 = 20)

- XIII. (a) Explain the method of moving averages for determining the trend in time series data.
(b) The production figures for steel in a factory for 7 years is given below: Fit a straight line trend to the data and predict the production in 2012.

| Year | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|----------------------------|------|------|------|------|------|------|------|
| Production (million tones) | 80 | 90 | 92 | 83 | 94 | 98 | 92 |

- XIV. (a) What are the basic analytical properties of normal distribution?
(b) A company has two units for manufacturing motor bikes. Unit 1 produces 70% of the bikes and Unit 2 produces 30%. 75% of the bikes in Unit 1 and 80% of the bikes in Unit 2 are rated as standard quality. A bike selected at random is found to be of standard quality. What is the probability that it was produced by Unit 2?

- XV. (a) Explain how the inverse matrix method is used for solving a system of linear simultaneous equations.
(b) Solve the following system of equations using either inverse matrix method or Cramer's rule.

$$2x_1 + x_2 - x_3 = 3$$

$$x_1 + x_2 + x_3 = 7$$

$$-x_1 + 2x_2 - x_3 = -1$$

