



MBA(F)I/12.13.1081

**MBA (FT) DEGREE I SEMESTER EXAMINATION DECEMBER 2013**

**SMS 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) Expenditure in ₹(lakhs)	52	62	65	70	76	80	78

Fit a regression line for the data.

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

Commodity	Price		Quantity	
	P <sub>0</sub>	P <sub>1</sub>	Q <sub>0</sub>	Q <sub>1</sub>
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 selects 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.

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

$$x_1 + x_2 + x_3 = 7$$

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

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