

**7168/BB2**

**OCTOBER 2008**

**BUSINESS STATISTICS AND MATHEMATICS**

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(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. Explain the application of statistical methods in the other sciences.
2. Write short notes on :
  - (a) Cluster sampling
  - (b) Statistical errors.
3. What is an Ogive? Discuss the uses in analysing and presenting data.
4. Calculate the Harmonic Mean :  
Class interval : 0-4 4-8 8-12 12-16 16-20 20-24  
Frequency : 6 10 12 16 6 4

5. Calculate the coefficient of variation :  
 Class interval : 0-10 10-20 20-30 30-40 40-50 50-60  
 Frequency : 5 10 20 40 30 20

6. Calculate third moment about mean for the following data :

$x$  : 10 20 30 40 50  
 $f$  : 4 7 20 7 2

7. Explain various types of correlation.

8. Compute the regression equation  $y$  on  $x$ .  
 $x$  : 0 2 4 6 8 10 12  
 $y$  : 4 8 10 14 16 20 21

SECTION B — (3 × 20 = 60 marks)

Answer any THREE questions.

9. (a) Find the angle between the lines  $y = \sqrt{3}x + 4$  and  $y = \frac{1}{\sqrt{3}}x + 2$ .

(b) A book publisher finds that the production cost of a book is Rs. 30 and the fixed cost per year amounts to Rs. 25,000. If each is sold at the rate of Rs. 50. Find

- (i) Cost function  
 (ii) The revenue function.

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10. (a) Define Index number? What are the classifications of index number?

(b) Explain the method of least squares.

11. (a) Explain various types of theoretical distribution.

(b) Discuss the role of forecasting in Business.

12. (a) Differentiate with respect to  $x$  :  $\frac{x^2 + 1}{x}$ .

(b) Find the maximum and minimum of  $y = \frac{x-1}{x^2 + x - 1}$ .

13. (a) Integrate with respect to  $x$

$$\frac{1}{\sqrt{x+a} + \sqrt{x-a}}$$

(b) The marginal cost function of a firm is  $2 + 3e^{3x}$  where  $x$  is the output. Find the total average cost function if the fixed cost is Rs. 500.

14. (a) If  $A = \frac{1}{\sqrt{2}} \begin{bmatrix} 1 & -1 \\ 1 & 1 \end{bmatrix}$  show that  $A$  is an orthogonal.

(b) Find  $A^{-1}$   $A = \begin{bmatrix} 1 & 3 & 7 \\ 4 & 2 & 3 \\ 1 & 2 & 1 \end{bmatrix}$ .

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