

**Subject : Business Mathematics & Statistics**

Day : Tuesday  
Date : 12/04/2016



Time : 11.00 AM TO 02.00 PM  
Max Marks : 80 Total Pages : 3

**N.B.:**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answers to both the sections should be written in **SAME** answer book.
- 4) Use of logarithmic, statistical tables and pocket **CALCULATOR** is allowed.

**SECTION – I**

**Q.1** Attempt **ANY FOUR** of the following: **[16]**

- a) The frequency distribution of marks of 100 students is given below:

Class	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60
Frequency	5	15	25	30	20	5

- Obtain : **i)** Class mark of 3<sup>rd</sup> class.  
**ii)** Frequency of 4<sup>th</sup> class.  
**iii)** Width of 5<sup>th</sup> class.  
**iv)** Frequency density of last class.

- b) Find quartiles for the following data:

X	5	10	15	20	25
f	8	12	25	11	09

- c) Draw ogive curve for the following data:

Class	30 – 35	35 – 40	40 – 45	45 – 50	50 – 55
Frequency	5	20	32	24	04

- d) Find mean and median for the following data:

X	10	20	30	40	50
f	05	08	13	06	08

- e) State the merits and demerits of median.

- f) Find mode for the following data:

Class	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
Frequency	7	8	15	11	9

**Q.2** Attempt **ANY FOUR** of the following: **[16]**

- a) A man sold two articles at Rs. 25,920/- each. These were sold at 8% gain and 4% loss respectively. Find the gain or loss percent in the whole transaction.
- b) Explain different types of shares.
- c) For the following Arithmetic Progression (A.P.) find  $t_n$  and  $s_n$ . Also find  $t_{10}$  and  $S_{10}$ .  
6, 10, 14, 18, -----.

**P.T.O.**

- d) The partnership firm, which has three partners with respective capitals Rs. 10,000, Rs. 5,000 and Rs. 3,000/- earns profit of Rs. 3,960/- in a year. How much each will get?
- e) Find the value of x and y if:  
 i)  $91 : 52 :: 77 : x$       ii)  $6 : y :: 10 : 30$ .
- f) The sum of present ages of three persons is 66 years. Five years ago, their ages were in the ratio 4 : 6 : 7. Find their present ages.

## SECTION – II

**Q.3** Attempt ANY FOUR of the following: [16]

- a) Find quartile deviation and coefficient of quartile deviation for the following data.  
 50, 17, 81, 47, 09, 55, 42, 53, 18, 05.

- b) Draw the scatter diagram and interpret the result:

X	41	67	65	92	84	77	27	100	38	80
Y	46	52	57	85	61	67	59	90	50	83

- c) Find mean deviation from median for the following data:  
 09, 13, 11, 17, 20.

- d) For bivariate data we have

$$\bar{X} = 53, \bar{Y} = 28, b_{yx} = -1.5, b_{xy} = -0.2$$

Find : i) Correlation coefficient between X and Y.

ii) Estimate Y for X = 75.

- e) Find range and coefficient of range for the following data:

X	6	7	8	9	10
f	2	3	5	6	4

- f) Find Standard Deviation (S.D.) and Variance for the following data:  
 19, 23, 21, 27, 30.

**Q.4** Attempt ANY FOUR of the following: [16]

- a) A certain sum amounts to Rs. 20,000/- in 8 years at the rate of 10% p.a. simple interest, find the sum.
- b) Find the compound interest on Rs. 10,000/- for 5 years at 12% p.a.
- c) Find the value of :    i)  ${}^{50}C_{48}$       ii)  ${}^{38}P_2$
- d) Find the area and perimeter of a triangle whose sides are 5 m, 4 m and 7 m.
- e) Define Row matrix and Diagonal matrix.
- f) The difference between the simple and compound interest on certain sum of money for 4 years at 6% p.a. is Rs. 168.75. What is the sum?

**Q.5 A)** Attempt **ANY TWO** of the following:

[08]

**a)** If correlation coefficient between X and Y is 0.75. Find the correlation coefficient between following:

- i)**  $X$  and  $-Y$                       **ii)**  $3X$  and  $5Y$   
**iii)**  $X - 15$  and  $Y + 10$             **iv)**  $\frac{X}{3}$  and  $\frac{Y}{-5}$

**b)** Find regression equation of X on Y for the following data:

X	6	8	7	9	5
Y	6	7	8	5	9

**c)** Information about the daily salaries of employees in firms A and B is given below:

Firm	No. of employees	Mean salary	S.D. of salary
A	586	52.5	10
B	647	47.5	11

Which firm has smaller variation in salary?

**B)** Attempt **ANY TWO** of the following:

[08]

**a)** Given:

$$A = \begin{bmatrix} 3 & -2 \\ 4 & 5 \end{bmatrix} \quad \text{and} \quad B = \begin{bmatrix} 1 & 2 \\ 5 & 3 \end{bmatrix}$$

Find :  $2A + B$  and  $2B - A$ .

**b)** Solve the following equations by using method of determinants

$$2x + y = 4, \quad x + 3y = 6.$$

**c)** A machine is depreciated at rate of 20% on the reducing balance. The original cost was Rs. 1,00,000/-. Find the cost after 5 years.

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