Regu-Y – 375

Seat No.	

M.B.A. (Textile) (Part – I) (Semester – I) (Regular) (New) Examination, 2013
MATHEMATICS AND STATISTICS FOR MANAGEMENT (Paper – III)
Sub. Code : 48322

Day and Date : Wednesday, 9-1-2013 Total Marks : 70

Time : 10.00 a.m. to 1.00 p.m.

Instructions *: 1) Question Numbers* ***1*** *and* ***5*** *are* ***compulsory****.*
2) Attempt ***any two*** *questions from the* ***remaining*** *Question Numbers* ***2*** *to* ***4****.*
3) Figures to the ***right*** *indicate* ***full*** *marks.*
4) ***Use*** *of non programmable calculator is* ***allowed****.*

1. A) i) Find $\frac{dy}{dx}$ for the following

a) $y = \frac{x^2 - 1}{x^2 + 1}$ b) $x^2 - 3xy + y^2 = 0.$

ii) A function f(x) is defined as

$$f(x) = \frac{1}{2} - x \quad , \quad 0 \le x \le \frac{1}{2}$$

$$= \frac{3}{2} - x \quad , \quad \frac{1}{2} < x \le 1$$

$$= x^2 - \frac{x}{2} \quad , \quad x > 1$$

Find f(2), $f\left(\frac{3}{4}\right)$, $f\left(\frac{1}{2}\right)$ and $f\left(\frac{1}{4}\right)$.

B) Define Mean and Mean Deviation (M.D.) about mean. Calculate M.D. about mean for the following data :

Value	7	8	9	10	11	12	13
Frequency	4	6	9	12	9	6	4

(10+10)

P.T.O.

2. A) i) Evaluate the following :

a) $\lim_{x \to a} \left[\frac{x^3 - a^3}{x^2 - a^2}\right]$ b) $\lim_{x \to 1} \left[\frac{\sqrt{x+5} - \sqrt{6}}{x-1}\right]$

ii) State the empirical relation between mean, median and mode. Use it to estimate mean of a distribution whose median and mode are 28 and 34 respectively.

B) Define correlation and coefficient of correlation. The price and demand of a commodity during a period of 10 days is as follows :

Price	14	10	11	16	15	18	13	12	9	11
Demand	12	21	18	10	11	10	15	15	20	19

Find Karl Pearson's correlation coefficient between price and demand. **(8+7)**

3. A) i) Given that f(0) = 8, f(1) = 68 and f(5) = 123. Construct a divided difference table and determine the value of f(2).

ii) At what rate will Rs. 3,000 yield a simple interest of Rs. 120 in 6 months ?

B) Define scalar matrix. If a matrix $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ then show that $A^2 - 4A$ is a scalar matrix. **(8+7)**

4. A) Define a square matrix. For a matrix $A = \begin{bmatrix} 1 & 2 \\ 3 & -1 \end{bmatrix}$ show that $A \cdot adj \cdot A = |A| \cdot I$, where I is unit matrix.

B) State the quations of regression line. In the comparative study of price in Mumbai (X) and price in Pune (Y), the following results were obtained.

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

i) Estimate the price in Mumbai when price in Pune is Rs. 30.

ii) Estimate the price in Pune when price in Mumbai is Rs. 60.

iii) Find correlation coefficien between price in Mumbai and price in Pune. **(8+7)**

5. Attempt **any four** : **20**

a) Using Cramer's rule, solve the equations

$$\frac{1}{x}+\frac{3}{y}=5, \frac{3}{x}-\frac{4}{y}=5.$$

b) An analysis of daily wages paid to workers in two firms A and B give the following results :

	Firm A	**Firm B**
Number of workers	50	60
Average wages in Rs.	60	48
Variance in Rs.	36	25

In which firm there is greater variability in individual wages ?

c) A company sold 30 metal chairs, 40 wooden chairs and 25 plastic chairs in February 2010 and 60 metal chairs, 50 wooden chairs and 75 plastic chairs in March 2010. The selling price of a metal chair is Rs. 150, that of wooden chair is Rs. 500 and plastic chair is Rs. 300. Find the total revenue in February and March 2010 using matrix method.

d) Find A.M. and S.D. from the following distribution of percentages of dividend paid by 50 companies.

Dividend	0 – 6	6 – 12	12 – 18	18 – 24	24 – 30
No. of companies	8	10	15	12	5

Also find coefficient of S.D.

e) Interpret, if (i) r = + 1, (ii) r = – 1 and (iii) r = 0.

f) Write note on Annuity and present value of annuity.