Seat
No.

M.B.A. (Part - I) (Semester - I) (Regular) Examination, March - 2016
MATHEMATICS AND STATISTICS FOR MANAGEMENT
(Paper - III)
Sub. Code : 48322

Day and Date : Tuesday, 29 - 03 - 2016   Total Marks : 70
Time : 03.00 p.m. to 06.00 p.m.
Instructions :   1)   Question number 1 and 5 are compulsory.
                2)   Attempt any two from question number 2 to 4.
                3)   Figures to the right indicate full marks.
                4)   Use of calculator is allowed.

Q1) A)   a)   Evaluate the following: [10+10]

   i) $\lim\limits_{x \to 0} \dfrac{\sqrt{4+x}-2}{x}$

   ii) $\lim\limits_{x \to 1} \dfrac{\sqrt{x+3}-2}{x^3-1}$

   iii) $\lim\limits_{x \to 1}\left[\dfrac{1}{x^2+x-2} - \dfrac{x}{x^3-1}\right]$

   b)   The total cost of x pencils is given by C(x) where C$(x) = 15 + 28x - x^2$.

        Find value of x when the marginal cost is 20, Also find average cost
        at this value of x.

   B)   a)   Solve for values of x, y and z by using Cramer's Rule if

        $x - y + z = 4$ --------- (I)

        $2x + y - 3z = 0$ --------(II) and

        $x + y + z = 2$ -----------(III)

   b)   Find the amount of Rs. 5,000 at 12% p.a. in 4 years compounded
        quarterly.

                                                                    P.T.O.

Q2) **A)** a) The total cost and total revenue function of a firm are

$$C = \frac{x^3}{6} - 6x^2 \text{ and } R(x) = 20x - \frac{13x^2}{2} + 10 \qquad [7+8]$$

Find

i) Marginal Cost

ii) Marginal Renenue

b) A sum of Rs. 4800 amounted to Rs. 6240 in a certain period, simple interest is 12% p.a. find the period?

B) a) Show that $A = \begin{bmatrix} 6 & 5 \\ 7 & 6 \end{bmatrix}$ satisfies the equation $A^2 - 12A + I = 0$ where I is a unit matrix of order 2.

b) If $A = \begin{bmatrix} 4 & -3 \\ -1 & 1 \end{bmatrix}$ show that $A \cdot A' \neq I$ where A' is transpose of matrix A.

Q3) a) Define mean and standard deviation. Find most suitable measure of central tendency. [7+8]

Height in cms	Below100	100–120	120–140	140–160	160 and above
No.of items	4	10	15	07	4

b) Explain positive and negative correlation. Find Karl-Pearson's correlation coefficient.

x	1	2	3	4	5
y	10	9	8	7	6

Q4) a) State the equations of regression lines. Obtain mean values of x and y, Regression coefficients if the equation of regression lines are. **[8+7]**

$3x - y - 5 = 0$ --------(I) and

$4x - 3y = 0$ -----------(II)

b) Explain various components of time series. State the difference between seasonal and cyclic variations.

Q5) Attempt any four from following: **[20]**

a) If $A = \begin{pmatrix} 4 & 3 \\ 2 & 1 \end{pmatrix}$ find inverse of A by adjoint method.

b) State the properties of determinant.

c) Define index number. What are the problems in construction of an index number?

d) What is relation between Laspeyre's, Paasche's and Fisher's quantity indices? Use it to find Laspeyre's price index if Paasche's and Fisher's price indices are 122 and 123 respectively.

e) Define with example.

i) Matrix

ii) Scalar matrix

iii) Square matrix

f) If $N = 10, \bar{X} = 120$ and $S.D. = \sigma = 5$

Find

i) Variance

ii) Coefficient of variance

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