G - 471

Seat No.	

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M.B.A. (Part - I) (Semester - I) (Regular) Examination, December - 2014
MATHEMATICS AND STATISTICS FOR MANAGEMENT
(Paper - III) (New)
Sub. Code : 48322

Day and Date : Monday, 22 - 12- 2014 **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 question number 2 to 4.**
3) **Figures to the right indicate full marks.**
4) **Use of non programmable calculator is allowed.**

Q1) A) Evaluate :

i) a) $\lim_{x\to 2}\left[\frac{x-2}{\sqrt{x}-\sqrt{2}}\right]$

b) $\lim_{x\to a}\left[\frac{x^3-a^3}{x-a}\right]$

ii) The cost function is given by $C = 2 + 3x + x^2$. Find average cost and marginal cost at $x = 3$.

B) Following data gives number of wickets taken by A and B in one day test matches.

Wickets taken by A	4	1	5	2	5	2	6
Wickets taken by B	4	5	6	5	3	4	4

Find who is consistent in taking the wickets.

[10 + 10 = 20]

P.T.O.

Q2) A) Differentiate the following w. r. t. x

i) a) $y = \dfrac{3x^2 - 2}{4x^2 + 1}$

b) $x^2 + y^2 = 3xy$

ii) A function $f(x)$ is defined as

$f(x) = 1 + x \;, \quad -1 \leq x < 0$

$= 1 - x \;, \quad 0 \leq x < 1$

$= x - 1 \;, \quad 1 \leq x \leq 2$

Find $f\left(\dfrac{-2}{3}\right), f\left(\dfrac{3}{4}\right), f\left(\frac{8}{7}\right), f(2)$

B) Define Karl pearson's corelation coefficient. Find correlation coefficient from the following data and comment on your result :

Supply :	8	4	5	3	7	6
Demand :	12	7	8	4	10	9

[8 + 7 = 15]

Q3) A) Define scalar matrix. If $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ then show that $A^2 - 4A$ is a scalar matrix.

B) Define M.D. about mean . Calculate M.D. about mean from the following data :

Value (x) :	7	8	9	10	11	12	13
Frequency (f) :	4	6	9	12	9	6	4

[8 + 7 = 15]

Q4) A) State the formula for Fisher's price index number. Compute Fisher's price index number from the following data and comment on it :

	Base year		Current year	
Commodity	Price in Rs.	Quantity in Kg.	Price in Rs.	Quantity in Kg.
A	12	10	15	15
B	20	8	30	12
C	50	2	70	3
D	100	1	110	2

B) Solve the equations by Cramers rules :

$x + y = 1, y + z = 7, z + x = 2$

[8 + 7 = 15]

Q5) Attempt any FOUR : **[20]**

a) Define Time series. Calculate three yearly moving averages from the data.

year	1	2	3	4	5	6	7	8	9	10
Sales in lakhs	4	7	10	12	10	15	20	22	23	22

b) At what rate percent will Rs. 380 amount to Rs. 893 in 15 years?

c) If $A = \begin{bmatrix} 2 & 1 \\ 0 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 2 \\ 3 & -2 \end{bmatrix}$ then verify that $|AB| = |A|.|B|$

d) Explain how to construct mean chart related to S.Q.C.

e) You are given $\bar{x} = 40$, $\bar{y} = 50$ $\sigma_x = 2.5, \sigma_y = 3.5$ and $r = 0.8$. Obtain the equation of line of regression of x on y and find best estimate of x when $y = 45$.

f) If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ then show that $A^2 - 5A + 2I = 0$, where $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$.