

Seat No.	
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M.B.A. (Part - I) (Semester - I) (CBCS) Examination, March - 2016

MATHEMATICS AND STATISTICS FOR MANAGEMENT

(Paper - III) (New)

Sub. Code : 57106

Day and Date : Monday, 28 - 03 - 2016

Total Marks : 80

Time : 11.00 a.m. to 2.00 p.m.

- Instructions :
- 1) Q. No. 1 and Q. 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) i) If $A = \begin{bmatrix} 1 & 0 \\ -1 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 1 \\ 3 & -2 \end{bmatrix}$ then show that

$(AB)' = B'A'$ where A' is transpose matrix of A .

- ii) The cost function is given by $C = 2 + 3x + x^2$. Find the total cost, Average cost and marginal cost at $x = 3$.
- b) Define mean and standard deviation [S. D.]. Calculate S.D. and C.V. from the following data. [10 + 10 = 20]

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

- Q2) a) Define Index number. State the formula for fisher's quantity index number. Calculate the Fisher's price index number from the following data.

Article	Base year		Current year	
	Price in Rs	Quantity in kg	Price in Rs.	Quantity in kg.
A	5	10	4	12
B	8	6	7	7
C	6	3	5	14

Also find value index number.

- b) Define the terms
- i) correlation
 - ii) coefficient of correlation.

Compute the coefficient of correlation between X and Y from the data. Given below and comment on your result.

X	3	4	6	2	5
Y	3	5	2	6	4

[10 + 10 = 20]

- Q3) a) Define inverse of a matrix. Show that the inverse of $A = \begin{bmatrix} 1 & 1 & 2 \\ 1 & 9 & 3 \\ 1 & 4 & 2 \end{bmatrix}$

exists and find its inverse.

- b) What is measure of dispersion? Calculate M.D. about mean and second quartile from the following data.

Class	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50
Frequency	2	2	3	2	1

[10 + 10 = 20]

- Q4) a) State the properties (any four) of normal curve. The weights of 1000 students are found to be normally distributed with mean 50 kgs. and S.D.5 kgs. Find the number of students with weights (i) less than 45 kgs. (ii) between 45 and 60 kgs.

[Given for S.N.V; area from $z = 0$ to $Z = 1$ is 0.3413 and from $z = 0$ to $z = 2$ is 0.4772]

- b) Explain the construction of mean chart.

Draw a mean chart for the following data of sample size $n = 5$ and state whether the process is under control or not.

Sample No.	1	2	3	4	5	6	7	8	9	10
Mean	11.2	11.8	10.8	11.6	11.0	9.6	10.4	9.6	10.6	10.0
Range	7	4	8	5	7	4	8	4	7	9

you are given, for $n = 5$, $A_2 = 0.58$.

[10 + 10 = 20]

Q5) Attempt any four.

[20]

- a) Define time series, state its components and explain any one of them.
- b) Using Cramer's rule, solve the following equations.
 $2x + 3y = 5, 3x - 4y = -1.$
- c) In what time will Rs. 8600 amount to Rs. 19436 at 7% p.a. by simple interest?

- d) If $A = \begin{bmatrix} 1 & -1 \\ 0 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$ then show that
 $(A + B)(A - B) \neq A^2 - B^2$

- e) Find x, if the matrix $\begin{bmatrix} 1 & 2 & 1 \\ 0 & x & 1 \\ 1 & 2 & 6 \end{bmatrix}$ is singular.

- f) Define regression coefficients. State the relation between correlation coefficient and regression coefficients.

