

Seat No.	
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M.B.A. (Part - I) (Semester - I) (CBCS) Examination, May - 2017
MATHEMATICS AND STATISTICS (Paper - III) (New)
Mathematics & Statistics For Management
Sub. Code : 57106

Day and Date : Friday, 05 - 05 - 2017

Total Marks : 80

Time : 03.00 p.m. to 06.00 p.m.

- Instructions : 1) Que. No. 1 and 5 are compulsory.
 2) Attempt any two questions from question No. 2 to 4.
 3) Figures to the right indicate full marks.
 4) Use graph papers where ever necessary.
 5) Use of non-programmable calculator is allowed.

- Q1) a) i)** The total cost function of a firm is $C = \frac{1}{3}x^3 - 5x^2 + 28x + 10$, where C is the total cost and x is a quantity produced. A tax at rate of Rs. 2 per unit of product is imposed and the producer adds it to his cost. If the market demand function is given by $p = 2530 - 5x$, where p is the price per unit of product. Find the profit function.
 ii) In what time will Rs. 8,000 amount to Rs. 8,820 at 10% p.a. compounded half yearly?

[6+4]

- b)** Define Mean and Median. Compute Mean and Median for the data given below.

[10]

Class :	10-15	15-20	20-25	25-30	30-35	35-40	40-45
f :	7	15	20	25	16	12	5

- Q2) a) i)** Solve for x, if $\begin{vmatrix} x & 2 & -1 \\ 2 & 5 & x \\ -1 & 2 & x \end{vmatrix} = 0$

- ii) Compute S.D. and C.V. for the data given below
 8, 12, 7, 9, 13, 5, 8, 6

[5+5]

P.T.O.

- b) Define Karl Pearson's correlation coefficient and obtain the same for the following data. [10]

X :	66	67	65	68	70	68	72
Y :	64	65	66	67	68	69	70

- Q3) a) i) Find the inverse of the matrix $A = \begin{bmatrix} 1 & 3 & 3 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{bmatrix}$ by adjoint method.

- ii) If $\bar{X} = 50$, $\bar{Y} = 40$, $b_{yx} = -1.2$, $b_{xy} = -0.3$, Estimate the most probable value of X if $Y = 10$ and the correlation coefficient.

[5+5]

- b) Define Index Numbers. Compute all the three weighted aggregate Quantity index number from following : [10]

Commodities :	:	A	B	C	D	E
Base Year Price	:	18	12	15	10	14
Base Year Quantity	:	14	11	15	12	13
Current Year Price	:	10	11	14	16	14
Current Year Quantity	:	18	12	17	13	15

- Q4) a) i) Solve the following equations by Cramer's rule :

$$3x + 2y + z = 3, \quad 2x - y + z = 5, \quad 5x + y - 3z = -2$$

- ii) The income distribution of 10000 persons was found to be normal with mean Rs. 750 and standard deviation Rs. 50. How many persons had their income exceeding Rs. 668

(Given area under standard normal curve between 0 & 1.64 is 0.4495)

[5+5]

- b) Means and Ranges of 10 samples are given below. Draw \bar{X} - chart and state your conclusion. (Given $n = 4$, $A_2 = 0.729$, $D_3 = 0$, $D_4 = 2.282$). [10]

Sample :	1	2	3	4	5	6	7	8	9	10
Means :	21.8	21.2	20.8	21.6	19.6	20	20.4	20.6	19.6	21
Ranges :	5	4	3	4	5	6	4	3	6	3

Q5) Write notes on any four :

- a) Bays Theorem
- b) Time series
- c) Characteristics of good average
- d) Functions used in Economics
- e) Regression
- f) Annuity



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