Total No. of Questions : 5]

SEAT No. :

P3399

[Total No. of Pages : 3

[5104] Ext.- 14
M.A. (Part - I)
ECONOMICS
Mathematical Economics and Statistical Techniques
(Annual Pattern)

Time :3 hours] *[Max. Marks :100*

Instructions to the candidates:

1) ***Attempt all questions.***
2) ***Figures to the right indicate full marks.***
3) ***Answers should be precies and to the point.***
4) ***Draw neat diagrams wherever necessary.***
5) ***Use of non-scientific calculator is allowed.***

Q1) Solve any one of the following. **[20]**

a) i) A firm's average production costs (AC) are given by the expression $AC = 450q^{-1} + 0.2q^{1.5}$.

ii) A firm has to pay fixed costs of Rs. 200 and then Rs.16 labour plus Rs.5 raw material for each unit produced of good x. Write an expression for average cost and simplify.

b) Calculate the point elasticity of demand for the demand schedule P = 60 – 0.2Q where price is (i) zero, (ii) Rs.20 (iii) Rs.40 and (iv) Rs.60

Q2) Solve any one of the following. **[20]**

a) Use inverses to solve system of equations.

$X_1 - x_2 + x_3 = 1$

$2x_2 - x_3 = 1$

$2x_1 + 3x_2 = 1$

b) IF a firm faces the marginal cost schedule $MC = 180 + 0.3q^2$ and the marginal revenue schedule is $MR = 540 - 0.6q^2$ and total fixed costs are Rs. 65 what is the maximum profit it can make?

Q3) Solve any one of the following. **[20]**

a) Draw multiple bar diagram for the following data and answer the following questions. (Rs. In thousands)

P.T.O.

Year	Sales	Gross Profit	Net Profit
1995	100	30	10
1996	120	40	15
1997	130	45	25
1998	150	50	25

i) Which year has maximum net profit?

ii) In 1997 what is the % of increase in gross profit as compared with 1995?

iii) Obtain the average net profit.

iv) Which year shows the lowest sale?

v) Which year has maximum difference between gross and net profit?

b) In the following grouped data 'x' are the mid points of the class intervals and 'c' is a constant. If the arithmetic mean of the original distribution is 35.84, find its class intervals.

x-c	-21	-14	-7	0	7	14	21	total
Frequency	2	12	19	29	20	13	5	100

Q4) Solve any one of the following.

a) From the prices of shares of X and Y below find out which is more stable in value : **[20]**

X	Y
35	108
54	107
52	105
53	105
56	106
58	107
52	104
50	103
51	104
49	101

b) The arithmetic mean and the S.D. of a set of 9 items are 43 and 5 respectively. If an item of value 63. is added to the, set find the mean and S.D. of 10^{th} item.

Q5) Solve any four of the following. **[20]**

a) Derive the determinant of matrix $A = \begin{bmatrix} 2 & 5 & 9 \\ 4 & 8 & 3 \\ 1 & 7 & 4 \end{bmatrix}$

b) Solve the simultaneous equation system $20x + 6y = 500$

$10x - 2y = 200$

c) A competitive market has demand schedule $p = 610 - 3q$ and the supply schedule $p = 20 + 2q$. Calculate equilibrium price and quantity.

d) Prepare a frequency table for the following data with width of each class interval as 10. Use exclusive method of classification

57	44	80	75	00	18	45	14	04	64	72	51
69	34	22	83	70	20	57	28	96	56	50	47
10	34	61	66	80	46	22	10	84	50	47	73
42	33	48	65	10	34	66	53	75	90	58	46
39	69										

e) The distribution of age at first marriage of 130 males was as given below; Calculate the average age.

Age (x)	18	19	20	21	22	23	24	25	26	27	28	29
No.(f)	02	01	04	08	10	12	17	19	18	14	13	12

f) Write the merits and demerits of mode.