Note:

1. All questions are compulsory.

2. All questions carry equal marks.

3. Draw neat labeled diagrams wherever necessary.

4. Use of simple calculator is allowed.

Section – 1

Q.1. Attempt <u>any four</u> from the following.   **(20)**

a) A function is given as f(x)=5x - 3, find its value at x=0,2,-3.

b) Explain demand function and supply function used in economics.

c) The total cost function is C= 500 + 15x and the total revenue function is R = 700 + 5x.Find the point at which there will be no profit , no loss i.e. break even point.

d) Differentiate w.r.t. x the following functions:

i)$x^4 + e^x + 5^x - \log x + 7$

ii) $4x^7 - 5e^x + 4 \times 3^x - 10\log x - 25$

e) Find the elasticity of demand if marginal revenue is 50 and average revenue is 75.

Q.2. Attempt <u>any four</u> from the following.   **(20)**

a) Calculate simple interest on Rs. 20,000 for 3 ½ years at 6% rate of interest per annum.

b) A principle amounts to Rs. 9,680, after 3 years and to Rs. 10,800, after 5 years. Find the principle and the rate of simple interest.

c) A sum of Rs. 12,000 becomes Rs. 17,280, at 20% compound interest p.a. Find the period.

d) The population of a city is 50 lakhs. If it increases to 73,20,500 after four years what will be the rate of increase per year ?

e) A second hand motor cycle is priced at Rs. 55,016 after 2 years, with 8% depreciation p.a. Find its original price.

Q.3. Attempt <u>any four</u> from the following. (20)

a) Draw a scatter diagram for the following data and comment on it.

X	15	20	33	25	25	35	36	40	18	22
Y	5	15	23	15	20	28	30	40	10	15

b) Find the coefficient of correlation for the following data:

X	14	8	10	11	9	13	5
Y	14	9	11	13	11	12	4

c) Calculate rank correlation coefficient between age of husband (x) and age of wife (y) both expressed in years , from the following data.

X	60	30	37	30	42	37	55	45
Y	50	25	33	27	40	33	50	42

d) Find the two regression equations and also estimate y when x =13 and x when y=10.

X	11	7	9	5	8	6	10	59
Y	16	14	12	11	15	14	17	99

e) Given the following data, find the two regression equations and estimate y when x=40. Also estimate x when y =35.

	X	Y
Mean	43	37
S.D.	3.1	2.8

And correlation coefficient r = 0.65.

Q.4. Attempt <u>any four</u> from the following. (20)

a) What is time series? Explain the components of time series.

b) Find the trend component for the following time series using free hand curve.

Year	1976	1977	1978	1979	1980	1981	1982	1983
Production of Rice (in million tonnes)	62	63	66	65	68	72	71	74

c) Explain Index numbers and its types?

d) For the following data calculate index numbers by (i) Aggregative Method (ii) Average Price Relative

Commodity	Unit	Price in Rupees	
		1985	1995
Rice	kg	4	8.50
Wheat	kg	3	7.00
Pulses	kg	8	30.00
Sugar	kg	6	13.00

e) Given that the cost of living index number for 2006 with 2000 as base is 150. If the income of a person is Rs. 15,000 in 2006. What is his real income in this period with 1980 as base.

Q.5. Attempt <u>any four</u> from the following. **(20)**

a) An unbiased cubical dice is thrown 5 times and the number appearing on its uppermost face is noted. Find the probability that the number of times an even number appears is

(i) 3 times   (ii) at least 4 times (iii) at most twice (iv) 2 or 3 times (v) all 5 times

b) A coin is tossed 8 times and it turned head 5 times. Find the probability that in next 5 throws , it turns head

(i) 3 times   (ii) at most twice (iii) only once (iv) at least 4 times

c) A poisson variate has standard deviation 3. Find P(0) and P(1). (Given : $e^{-9} = 0.000123$)

d) Explain the properties of Normal Distribution and Normal Curve.

e) If X follows normal distribution with mean 120 and variance 1600, find

(i) $P(X <= 140)$ (ii) $P(X >= 110)$ (iii) $P(100 <= X <= 130)$