Instructions :
1) Each questions carries equal marks.
2) All questions are compulsory.
3) Simple calculators are allowed.
4) Figures to the right indicate full marks.

Q.1 a) Define i) Coefficient of Variation.   **4**
ii) Coefficient of range.

b) Find lower quartile Q_1 and upper quartile Q_3 for the following data.   **6**

Profit (in 1000 Rs.)	No. of shops
40-44	2
44-48	5
48-52	12
52-56	18
56-60	16
60-64	10
64-68	7

Plot Q_1 & Q_3 graphically.

c) Find the missing frequency given that the average travelling time to office for the following group is 55 minutes.   **5**

Travelling :	0-20	20-40	40-60	60-80	80-100
Time in minutes :	5	20	—	21	17

OR

Q.1 a) Give merits and demerits of median. Also give its applications.   **4**

b) The following data are the percentage of employee in 30 firms who have computer programming experience.   **6**

22,   32,   37,   27,   29,   17,   12
18,   34,   38,   21,   36,   29,   33
27,   28,   37,   39,   27,   34,   35
33,   17,   18,   25,   26,   40,   34
24,   23.

Prepare frequency distribution of the above data and plot frequency curve for the distribution.

c) Find mode for the following data which gives I.Q. of some children   **5**

I.Q.	No. of children
95-100	5
100-105	10
105-110	25
110-115	27
115-120	15
120-125	10

Q.2 a) The average marks of a group of students are 57. The average marks of 70 then are 60 and the average marks of the remaining students are 50. Find the total number of students.   **4**

b) The following data gives the height in cm. (x) and weight in kg (y) of 24 children. Prepare bivariate frequency distribution taking class intervals as :-

(x,y) values are   **6**

(106, 42), (117, 49), (100,36), (99,35), (110,40)
(108,35), (109,40), (102,38), (97,40), (113,48)
(114,50), (108,42), (107,44), (102,38), (101,39)
(113,48), (99,44), (108, 37), (112,50), (115,51)
(106,46), (110,40), (107,42), (112,48)

Take class intervals as 95-100, 100-105, 105-110, ...
for Height (x) and 35-40, 40-45, 45-50....
for Weight (y)
Write marginal frequency distribution of x.
Write conditional frequency distribution of y when x lies between 100-110.

c) Find variance and standard deviation of the following data.   **5**

05-09	3
09-13	8
13-17	14
17-21	16
21-25	12
25-29	9
29-33	4

OR

Q.2 a) Find geometric mean of the following data.
15, 23, 29, 34, 48, 62, 75   **4**

b) Following data gives marks in Mathematics (x) and marks in Physics (y) of some students.

Marks in Maths (x) : 12 15 18 24 25 32
Marks in Physics (y) : 50 40 80 85 75 60

Find correlation coefficient between x and y comment on the result   **6**

c) A man draws two balls from a bag with 4 white and 5 black balls. What is the probability that   **5**
i) both the balls are white.
ii) at the most 3 black balls are selected.

Q.3 a) Find combined arithmatic mean and standard deviation for the following data.

Section	No. of workers	Mean wages	Standard deviation
A	60	120	7
B	90	i15	8

     5

b) Two machines A and B in a factory are used for boring metal rods. Machine A gives variance of 25 mm in diameter measurement with average diameter of 52 mm.

c) Find the two regression equations from the following data : **6**

$\Sigma(x-\bar{x})(y-\bar{y}) = 135, \quad n = 5$

$\Sigma(x-\bar{x})^2 = 96, \qquad \Sigma(y-\bar{y})^2 = 206$

$\Sigma x = 120, \qquad \Sigma y = 180$

Also find correlation coefficient r.

OR

Q.3 a) i) Give mathematical definition of probability.

ii) Explain perfect positive correlation between two variables. **4**

b) Find regression line of y on x using following data : **6**

x : 2 3 7 12 15

y : 18 20 12 15 11

Find most probable value of y when x = 10.

c) A committee of 5 members is to be formed from 6 statisticians and 4 mathematicians.
Find the probability that the committee contains. **5**
i) All Statisticians
ii) At least 2 mathematicians

Q.4 a) Calculate 4-yearly moving average for the following data. **5**

Year	Production in metric tons
1981	400
1982	450
1983	430
1984	480
1985	470
1986	430
1987	440
1988	460
1989	490
1990	470

b) Give addition theorem of probability. **6**

If $P(A) = 0.6, \quad P(B) = 0.7$

and $P(P \cup B) = 0.8$

find i) $P(A \cap B)$

ii) $P(A/B)$

iii) $P(B/A)$

c) Sate whether following statements are true or false with reason. **4**

i) If there are 9 values in the data, 5th value is the median.

ii) The only average using all the data values is arithmatic mean.

OR

Q.4 a) Calculate 3 -yearly moving average for the following data : **5**

Year	Production of Tea
1991	1600
1992	1800
1993	1700
1994	1700
1995	1600
1996	1900
1997	1800
1998	2000

b) What are seasonal variations. **3**

c) Find the regression of y on x given the following data.

$n = 10$, $\bar{x} = 30$, $\bar{y} = 50$, $\sigma x = 4$, $\sigma y = 5$, $r = 0.8$

find y when x = 40. **5**

d) **Fill in the blanks :** **2**

i) If A and B are two independent events then P(A) · P(B) = _____

ii) If P(A ∩ B) = $\emptyset$, then A and B are called as _____events.