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

Q.1 **a)** **Define :-**   **6**
i) Primary data
ii) Segmented bar diagram
iii) Weighted mean

b) The following table gives height (X) in cm. and weight (Y) in kg. of group of 20 students   **6**

(135, 36),   (145, 35),   (142, 40),   (130, 33),
(136, 39),   (141, 36),   (130, 33),   (147, 36),
(142, 36),   (139, 36),   (145, 40),   (148, 37),
(146, 42),   (137, 41),   (138, 38),   (134, 37),
(132, 28),   (150, 27),   (136, 33),   (149, 38),

Taking class intervals 130–135, 135–140, 140–145,......, etc. for height (X) and 25–30, 30–35,......, etc. for weight (Y), prepare a bivariate frequency distribution table.
Also write marginal frequency distributions of both X and Y

c) If $Q1 = 6.5$, $Q2 = 8.9$ & $Q3 = 15$,   **3**
Find i) Inter - quartile range
     ii) Quartile deviation
     iii) Coefficient of qurtile deviation

OR

Q.1 **a)** **Define :-** i) Mode for grouped data   **4**
            ii) Arithmetic mean for raw data

b) The following data gives monthly salaries of 30 employees of a certain factory   **6**

1250	1300	1325	1505	1600	2000
2050	1200	1425	1450	1525	1500
2500	2520	1420	1425	1350	1330
1230	1280	1450	2250	2160	1260
1420	1580	· 1650	1800	1820	1900

Prepare frequency distribution of above data using stag's formula.
Draw Histogram for the above frequency distribution

c) The medium age of the following distribution is 44 years. One frequency is missing. Find the missing frequency   **5**

Age in Years	No. of persons
25 - 30	8
30 - 35	10
35 - 40	24
40 - 45	30
45 - 50	---
50 - 55	20
55 - 60	14

Q.2 a) Consider following frequency distribution.   **6**

C. I.	36 - 40	40 - 44	44 - 48	48 - 52	55 - 56	56 - 60
Frequency	4	8	10	12	6	2

Find i)   Mean for the above data
      ii)   Draw frequency polygon
      iii) Draw less than ogive curve

b) Find lower quartile Q_1 & upper quartile Q_3 for the data in Q.2 (a).   **5**

c) Find standard deviation of the following frequency distribution.   **4**

Profit in sales (in' 000 Rs.)	No. of shops
16 - 20	10
20 - 24	16
24 - 28	6
28 - 32	3

OR

Q.2 a) Find Q_1 & Q_2 for the following data   **6**

Age in Years	No. of teachers
25 - 30	3
30 - 35	8
35 - 40	12
40 - 45	7
45 - 50	2

b) **Define :-** i)   Mutually exclusive events   **6**
                       ii)   Mathematical definition of probability
                       iii) Merits of mean.

c) Following information is available regarding two players in their last 5
matches.   **3**

	Player I	Player II
Average runs Scored	62	55
Standard deviation of runs	15.8	18.22

Identify which player is more consistent?

Q.3 a) A box contains 8 red, 9 blue & 10 black balls. One ball is drawn at random
from this box. Find the probability that the selected ball is
i) red   ii) not blue   iii) either red or black.   **6**

b) Heights and weights of 6 children-   **5**

Height in cm.	120	125	127	130	134	144
Weight in kg.	42	47	48	46	50	49

Find value of correlation coefficient between height & weight.

c) The two regression lines between x & y are given below.   **4**

Find $\bar{x}$, $\bar{y}$ & r = correlation coefficient

$4y = 15x - 530$

$20x = 3y + 975$

<div align="center">OR</div>

Q.3 **a)** A bag contains 20 tickets numbered from 1 to 20 One ticket is drawn randomly from the bag   **6**

Let Event   A = Getting an odd no.

               B = Getting odd. No.

               C = Getting multiple of B, A, & C.

Write down sample space for all the above 3 events.

Write $A \cup B \cup C$ and $B \cap C$.

b) Following data is available for a sample of size 10–   **6**

n = 10, $\sum x = 100$, $\sum y = 120$,

$\sum xy = 1200$, $\sum x^2 = 1500$, $\sum y^2 = 6000$

Find   i) $\bar{x}$ ii) $\bar{y}$ iii) Cov (x, y)   iv) r_{xy}

c) A & B are two mutually exclusive events and p(A) = 1, p(B) = 1 Find   **3**

i) $P(A \cup B)$ ii) $P(A \cap B)$

Q.4 **a)** Following data gives the number of workers in a factory. Calculate 3-yearly moving averages.   **5**

Year	No. of workers
1985	2400
1986	2430
1987	2500
1988	2490
1989	2500
1990	2550
1991	2540
1992	2556
1993	2580

b) Following data are available in respect of distribution of height for two group of boys.   **6**

	Group I	Group II
Number of boys	150	200
Arithmatic mean	160 cm	163.5 cm.
Standard deviation	3	4

Find combined arithmetic mean and standard deviation of the two groups taken together.

Which group shows are variability?

c)   **Fill in the blanks.**   4

i)   Correlation coefficient r always lies between _____ & _____

ii)   The weighted average of 10 and 15 with weights 3 & 2 is _____

iii)   _____ is an appropriate average when data values are given in term of percentages   .

iv)   Mean deviation of given data is minimum when it is taken about _____

OR

Q.4   **a)**   **One card is drawn from a full pack of 52 cards. Find the probability that it is**   6

i)   a diamond or a king

ii)   red card

iii)   ace card

b)   Find Geometric mean of the following observations   5

χ_i :   13   16   25   28   32

f_i :   3   5   7   6   4·

c)   **Fill in the blanks**   4

i)   If arithmetic mean of 5 numbers is 36, total of these 5 numbers must be _____

ii)   Q2 is same as _____

iii)   If value of correction correlation coefficient between two variables x and y is –0.78, then x and y are _____ correlated

iv)   There is around _____ % of the data lies between Q1 and Q3.

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