CHARTERED ACCOUNTANCY - BUSINESS MATHS AND STATISTICS.

01. The advertising cost and sales income of a company for 5 months are given below.

Ad. cost (Rs mn)	(x)	6	2	10	4	8
Sales income (Rs mn)	(y)	9	5	11	8	7

(i) Find the two normal equations that should be solved to find out a and b of the regression equation of y on x

(ii) Find the equation of the regression line of y on x.

(iii) Estimate the sales income when the ad. cost is Rs 9 mn.

(iv) Find the correlation coefficient between x and y.

02. For a given set of data, $\Sigma x = 38$, $\Sigma y = 89$, $\Sigma xy = 495$, $\Sigma x^2 = 270$, $\Sigma y^2 = 1147$, $n = 7$

Find the equation of the regression line of y on x.

(Ans: $y = 0.186x + 11.7$.

03. For a given set of data, $\Sigma x = 680$, $\Sigma y = 996$ $\Sigma xy = 24\,844$, $\Sigma x^2 = 20154$, $\Sigma y^2 = 34670$, $n = 30$.

Find the correlation coefficient between x and y.

(Ans. $r = 0.82$)

04.

x	y
10	4
12	7
8	9
14	11
3	12
8	16

$\Sigma xy = 634$, $\Sigma x^2 = 737$, $\Sigma y^2 = 667$

Calculate the product moment correlation coefficient between x and y by using the given data.

(Ans: $r = 0.655$).

05. 80 people were asked to measure their pulse rates when they woke up in the morning. The mean was 69 beats and s.d. 4 beats. Find 95% C.I. for the population mean. (Ans: 68.12, 69.88).

06. In a survey carried out in a large city, 170 households out of a random sample of 250 owned at least one pet. Find 95% C.I. for the proportion of households in the city who own at least one pet. (Ans: 0.622, 0.788).

07. The weights of steel sheets produced by a plant are known to be normally distributed with mean 31.4 kg and s.d. 2.4 kg. Find the percentage of sheets that weigh more than 35.6 kg. (Ans: 4.01%).

08. The lifetime of a torch battery has a normal distribution with mean 210 hrs and s.d. 12 hrs. Find the probability that a torch battery selected at random will last between 205 hrs and 215 hrs. (Ans: 0.3231).

09. A discrete random variable has the probability distribution shown in the table below.

x	1	2	3	4
$P(x)$	0.2	0.3	0.4	0.1

Calculate (i) $P(2 < x \leq 3)$ (ii) Mean (iii) Variance.
(Ans: 0.7, 2.4, 0.84).

10. In a particular mixed school there are 1500 children. Of them 60% are boys and 40% are girls. 40% of the boys play tennis and 30% of girls play tennis. A pupil is selected at random, find the probability that
(i) the pupil is a girl who plays tennis
(ii) the pupil plays tennis
(iii) the pupil is a girl, given that the pupil plays tennis
(Ans 0.12, 0.36, 0.33).