ASSIGNMENT-I

1. A continuous R.V. has the pdf defined by $f(x) = \begin{cases} kxe^{-\lambda x} & ; \text{ if } x \geq 0 \\ 0 & ; \text{ otherwise} \end{cases}$.

   Determine the constant k and find mean and variance.

2. The distribution of a random variable x is given as follows.

x = xi	-2	-1	0	1	2	3
p(x=xi)	0.1	k	0.2	2k	0.3	k

   Find the value of k, mean and variance of x.

3. Given the following probability distribution of X computer

   (i) E (x) (ii) E (2 x ± 3) (iii) E (x^2) (iv) V (x) (v) V(2 x ± 3)

x		-3	-2	-1	0	1	2	3
f(x)		0.05	0.10	0.30	0	0.30	0.15	0.10

4. Find the first four central moments Skewness and Kurtosis to the following data

x	0	1	2	3	4	5	6	7	8
f	1	8	28	56	70	56	28	8	1

5. A continuous random variable X has the distribution function

$$F(x) = \begin{cases} 0, if\ x \leq 1 \\ k(x-1)^4, if\ 1 < x \leq 3 \\ 1, if\ x > 3 \end{cases}$$

   Determine (i) f(x) (ii) k (iii) Mean

6. Find the first four central moments, Skewness and Kurtosis to the following data

CI	0-10	10-20	20-30	30-40	40-50	50-60	60-70
f	8	12	20	30	15	10	5

7. If 20% of the memory chips made in a certain plant are defective. What are the probabilities that in a lot of 100 randomly chosen for inspection?

   a. Utmost 15 will be defective
   b. Exactly 15 will be defective.

8. Out of 800 families with 5 children each, how many would you expect to have a) 3 boys b)5girls c) either 2 or 3 boys. Assume equal probabilities for boys and girls.

9. The distribution of typing mistakes committed by typist is given below. Fit a Poisson distribution for it.

Mistakes per page	0	1	2	3	4	5
Number of pages	142	156	69	27	5	1

10. X is a normal variable with mean 30 and S.D. 5. Find the probability that
    i. $26 \leq X \leq 40$ ii. $X \geq 45$
11. From following information find the correlation coefficient between advertisement expenses (in Lakhs) and sales (in Lakhs) volume using Karl Pearson's coefficient of correlation method.

Firm	1	2	3	4	5	6	7	8	9	10
Expenses	11	13	14	16	16	15	15	14	13	13
Sales	50	50	55	60	65	65	65	60	60	60

12. The marks in statistics and Mathematics of 10 students are given below then find the rank Correlation

Statistics	60	62	75	89	92	45	70	72	85	90
Mathematics	66	55	78	49	74	69	77	94	80	52

13. From the following data find rank correlation coefficient

X	82	68	75	61	68	73	75	68
Y	81	71	71	68	62	69	81	70

14. From the following data obtain 2 regression lines

X	7	8	5	9	12	9	10	5
Y	4	5	2	6	9	5	7	12

15. Explain different types of Sampling Methods