b) In a normal distribution 31% of items are under 45 and 8% are over 64. Find the mean and S.D of distribution. **(8)**

Unit - II

3. a) Calculate the first four moments about the mean of the following distribution. Also calculate β_1 & β_2. **(8)**

x:	1	2	3	4	5	6	7	8	9
f:	1	6	13	25	30	22	9	5	2

b) What is the expectation of the number of failures proceeding the first success in an infinite series of independent trials with constant Probability "p" of success in a trial. **(8)**

OR

4. a) If $f(t)$ is probability density of time to failure T of a system and $h(t)$ is failure rate function. Find failure rate function & mean time to failure, when

(i) $f(t) = \lambda\, e^{-\lambda t}$ (ii) $f(t) = \lambda^2\, t e^{-2t}$ **(8)**

b) If the life time of a component has probability density function $\lambda e^{-\lambda t}$, $\lambda > 0$, $t > 0$. Compute its time to failure, variance and failure rate function. **(8)**

Unit - III

5. a) Define Pure Birth Process and Pure Death Process. **(8)**

b) In a Railway garrage, trains arrive at a rate of 30 trains per day. Suppose that the inter arrival time follows an exponential distribution and the service time distribution is also exponential with an average 36 minutes. Determine

i) The mean queue size

ii) The probability that the queue size exceeds 10.

If the input of train increases to an average 33 per day. What will be change in I & II? **(8)**

OR

6. a) A super market has two girls during at the counters. The service time for each customer is exponential with mean 6 minutes, when customers arrive in a Poission fashion at the rate of 12 per hour. Determine

i) The probability that an arriving customer has to wait for service.

ii) The average number of customers in the system. **(8)**