Unit IV

Qu-1) An insurance salesman sells policies to 5 men, all are identical age & in good health. the probability that a man of particular age will be alive 30 years is 2/3. then find the probability that in 30 years

① All 5 men
② at least 3 men
③ only 2 men
④ at most 1 man.

2) If 3 % of electric bulbs manufactured by a company are defective find the probability that in a sample of 100 bulbs ① exactly two ② More than 5 (iii) betn 1 & 3 ④ at most 2 ⑤ At least 2 bulbs will be defective.

(3) A machine produces bolts ~~coil~~ which are 100% defective. find the probability that in a ~~samp~~ random sample of 400 bolts produce by this machine.
① betn 30 & 50 ② at the most 30 ③ 52 or more of the bolts will be defective.

(4) A density funct^n of R.V X is

$$f(x) = \begin{cases} 2e^{-2x} & , x \geq 0 \\ 0 & , \text{otherwise} \end{cases}$$

Find (1) $E(X)$ (2) $Var(X)$ (3) σ_x (4) $E[(x-1)^2]$

(5) Find the moment generating funct^n of the R.V

$$X = \begin{cases} 1/2 & , \text{prob } 1/2 \\ -1/2 & , \text{prob } 1/2 \end{cases}$$

also find the first 4 moments about the origin.

(6) A density funct^n of R.V X is ~~f(x)~~

$$f(x) = \begin{cases} 2e^{-2x} & , x \geq 0 \\ 0 & , \text{otherwise} \end{cases}$$

find Moment Generating funct^n & 1st 4 moments about origin.

(7) Out of 800 ~~to~~ families, with 5 Children each, how many would ~~be~~ you except to have.
~~(1) with 5 Children each~~
(1) 3 boys, (2) 5 girls (3) either 2 or 3 boys.
Assume equal probabilities for boys & girls.

(8) A R.V X is defined by

$$X = \begin{cases} -2 & , \text{prob } 1/3 \\ 3 & , \text{prob } 1/2 \\ 1 & , \text{prob } 1/6 \end{cases}$$

Find ① $E(X)$ ii) $E(2X+3)$ iii) $E(X^2)$
iv) $E(X^2+5X)$ v) $Var(X)$ vi) σ

9) A R.V X has probability density functn

$$f(x) = \begin{cases} \frac{1}{b-a} \\ 0 \end{cases}, \text{ otherwise.}$$

Find i) mean of X
ii) Variance of X
iii) First two moments about origin.

10) Suppose that the customers are arriving at a ticket counter accn to a piosson's process with a mean rate of 2 per minutes. then E an arrival of 5 min. Find the probability that the no. of customers arriving

① Exactly 5 ② less than 4 ③ greather than 3.