Tutorial No-3
Title: Probability Distribution
Course Name: Computational Mathematics.   Class: S.Y.B.Tech (CSE- B)
Date-12/10/22

Example 1: The probability density function of a random variable x

zero except at x=0,1,2.At these points

$$p(0) = 3c^3, \ p(1) = 4c - 10c^2, \ p(2) = 5c - 1$$

 Find i) the value of c ii) $p(0 < x \le 2)$

Example 2: A random variable x has the following probability

distributions

X	-2	-1	0	1	2	3
P(x)	0.1	k	0.2	2k	0.3	k

 Find (i) the value of k (ii) mean   (iii) variance

     (iv) P(X $\ge$ 1)   (v) P(X<1)   (vi) P (-2<X<2).

Example 3: Following is the probability density function of a random

variable x. $f(x) = k \ e^{-2x}$, $x > 0$. Find the value of k.

 Example 4: Following is the probability density function of a random

variable x. $f(x) = kx^4.e^{-x/2} \ \ 0 \le x < \infty$

 i) Find the value of k.   ii) mean and variance.

Example 5: If the sum of mean and variance of a Binomial distribution

for 5 trials is 4.8 find the distribution.

Example 6: Let X be a binomial random variable with parameter 5 and

0.7 compute 1) $P(X = 2)$ 2) P $(X \le 5)$ 3) $P(X > 2)$

Example 7: The probability that on joining Engineering College,

a student will successfully complete the course of studies is 3/5. Determine the probability that out of 5 students joining the college (i) none, (ii) all 5 and (iii) at least two will complete the course successfully

Example 8: Out of 800 families with 5 children each how many would you expect to have i) 3 boys ii) 5 girls

Example 9: In a sampling the mean number of defective bolts manufactured by a machine in a sample of 20 is 2. Determine the expected number of samples out of such 500 samples to contain at least 2 defective bolts.

Example 10: A set of 4 coins were tossed 160 times to produce the following distribution,

Number of heads	0	1	2	3	4
Frequency observed	17	52	54	31	6

Fit a binomial distribution i) if the coin is unbiased. ii) If the coin is biased.

Example 11: Suppose that X has Poisson distribution.

If $P(x=2) = P(x=3)$, Find 1) m 2) $P(x=4)$.

Example 12: Find the probability that at most 3 defective bulbs will be found in a box of 400 bulbs if it is known that 1 % of the bulbs are defective.

Example 13: A controlled manufacturing process is 0.2% defective. What is the probability of taking 2 or more defective from a lot of 100 pieces? i) Using binomial distribution

ii) Using Poisson approximation.

Example 14: If the number of accidents in a industry during a month has Poisson probability distribution with mean of 4, find probability that in coming month there will be at least 3 accidents