1) A uniform cubic die is rolled. If X is random variable denoting a no. on upper most surface of die. Find the probability distribution function of X hence find its mean & variance.

2) The distribution no. of words written per day by a certain writer over a period of one year shows uniform distribution (1000, 2000). Find the prob. that on a randomly chosen day he wrote   a)   at most 1200 words   b) In between 1250&1750 words.

3) In a certain factory 65% of workers are members of union. If sample of 7 workers is selected from this factory, find prob. that sample consist of
   a) At least one union member   b) Exactly 4 union member

4) In a class of 120 students there are 6 girls and rest are boys. A group of five student is selected randomly from this class. Find prob. of that group consist of
   a) three girls   b) three boys

5) It is observed that 2% of bulbs made by a factory are defective. Find prob. that in a sample of 200 bulbs
   a) Less than 2 bulb   b) more than 3 bulbs are defectives.

6) The chance of a person aged 60 year will die within a year is 1.5%.Find prob. that out of ten such person at least nine will celebrate there next birthday.

7) Define Binomial distribution of a random variable X.
   If X is a random variable following binomial distribution with parameter n, p obtain an expression for moment generating function and mean of the distribution.

8) Define Distribution function for random variable X.
   i.   A random variable X has following probability distribution function
   ii. Find k, p (x <6), p (0 < x <5)

X=x	0	1	2	3	4	5	6	7
P(X=x)	0	K	2k	2k	3k	K^2	$2 K^2$	K^2+1

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9)   Let the random variable X have the probability distribution

   a. $f(x) = e^{-x}$, $x > 0$

                 $= 0$,   otherwise.

Find an expression for mean & moment generating function

Define probability distribution of a discrete random variable.

A random variable X has following probability distribution function.

Find K, p $(0 < x < 3)$ &   p $(x > 1)$.

10)   Define standard normal distribution. If X follows standard normal variable

X=x	1	2	3	4	5	6
P(X=x)	K	2k	3k	2k	K	k

with mean 20 and variance 4, then find
   $i)\ p(21 < X < 24)$ $ii)\ p\ (X < 30)$

11)   The mean life of large lot of tubes is 1570 hours with standard deviation 150 hours. A sample of 100 tubes is drawn from it , find the probability that mean life of these tubes will i) Exceed 1600 hours   ii) not exceed 1540 hours

12)   For the continuous random variable X its probability distribution function is given by
   i.   by$f(x) = 12x^2(1 - x)$, $0 < x < 1$
   ii.   Find mean and variance of the distribution.

13)   The distribution no. of words written per day by a certain writer over a period of one year shows uniform distribution (1000, 2000).Find the prob. that on a randomly chosen day he wrote: a) at most 1200 words   b) In between 1250 &1750 words.

14)   If the marks of particular subject are assumed to follows normal distribution with mean 40 and variance 9. Find how many out of 1000 student get marks;
   i) Below 35   ii) Between 43 & 46

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15) The individuals are found to be chosen at random from a normal population and their height 63, 63, 66 67, 68, 69, 70, 71, 71 inches. Test if the sample belongs to the population whose mean height is 66''.

16) The time between release from prison and the commission of another crime is uniformly distributed between 0 and 5 years for a high-risk group. Give the equation and graph the pdf for X, the time between release and the commission of another crime for this group. W What percent of this group will commit another crime within two years of their release from prison?

17) A manufacturer claims that at most 10 per cent of his product is defective. To test this claim, 18 units are inspected and his claim is accepted if among these 18 units, at most 2 are defective. Find the probability that the manufacturer's claim will be accepted if the actual probability that a unit is defective   (i) 0.05   (ii) 0.10   (iii) 0.15

18) The lifetimes in years for a particular brand of cathode ray tube are exponentially distributed with a mean of 5 years. What percent of the tubes have lifetimes between 5 and 8 years? Draw a graph of the pdf and shade the area which represents the probability of the event $5 < X < 8$ where X represent lifetimes.

19) The probability mass function of a random variable X is zero except at the points $i = 0, 1, 2$. At these points it has the values $p(0) = 3c\ 3, p(1) = 4c - 10c\ 2, p(2) = 5c - 1$ for some $c > 0$
  i. Determine the value of c
  ii. Compute the following probabilities $P(X< 2)$ and $P(1 < X \leq 2)$.
  iii. Find the largest X such that $F(x) < ½$
  iv. Find the smallest x such that $F(x) > 1/3$

20) A group of 400 children is given an intelligence test. The average I.Q. of the group is found to be 105 with standard deviation 16. Calculate i) $P(x >135)$ ii) $P(x < 85)$

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