Unit IV

Probability and Probability distribution

Sr. No.	Questions (Binomial and Poisson distribution)	Year
1.	If the probability that an individual suffers a bad reaction from certain injection is 0.001, determine the probability that out of 2000 individual, more than 2 individuals will suffer a bad reaction.	[NOV-2013 MECH]
2.	Number of road accidents on a highway during a month follows a Poisson distribution with mean 5. Find the probability that in a certain month , number of accidents on the highway will be a) less than 3 b) between 3 and 5	[MAY-2014 MECH]
3.	Between 2.00pm and 3.00 pm the average numbers of phone calls per minute coming into company are 2.00. Find the probability that during one particular minute there will be 2 or less calls.	[MAY-2015, NOV-2014 MECH]
4.	An insurance company found that only 0.001 % of the population involved in a certain type of accident each year. If its 1000 policy holders are randomly selected from the population, what is probability that not more than two of its clients are involved in such an accidents.	[NOV-2013 CIVIL]
5.	If the probability that an individual suffers a bad reaction from certain injection is 0.001, determine the probability that out of 1000 individual, more than 2 individuals will suffer a bad reaction.	[MAY-2014 CIVIL]
6.	Assume that the probability of an individual coal miner being killed in a mine accidents during a year is $\frac{1}{2400}$. Use Poisson's distribution to calculate the probability that in a mine employing 200 miners there will be at least one fatal accident in a year.	[NOV-2014 CIVIL]
7.	On an average a box containing 10 articles is likely to have 2 defectives. If we consider a consignment of 100 boxes, how many of them are expected to have three or less defectives.	[MAY-2016 COMP,CIVIL]
8.	If the probability that a concrete cube fails is 0.001.Determine the probability that out of 1000 cubes i) Exactly two ii) More than one cube will fail.	[COMP MAY-15]
9.	The incidence of a certain disease is such that on the average 20% of worker's suffer from it. If 10 workers are selected at random find the	[COMP NOV-14

	i) Exactly 2 workers suffer from disease ii) Not more than 2 workers suffer	
10	There is a small probability of 1/1000 for any computer produced to be defective. Determine in a sample of 2000 computers the probability that there are: a) No defectives and b) 2 defectives.	May 18 Comp
11	On an average 20% of the workers in an industry suffer with a certain diseases. If 12 workers are chosen from the industry find the probability that a) Exactly 2 workers suffer from the diseases b) At least one worker suffers form the diseases.	May 18 Comp.
12	If mean and variance of a binomial distribution are 12 and 3 respectively find $P(r \geq 1)$.	May 2017 C Ivil

Normal distribution

1.	A random sample of 200 screws is drawn from a population which represents size of screws. If a sample is distributed normally with mean 3.15 cm and standard deviation 0.025 cm, find the expected number of screws whose size fall between 3.12cm and 3.2cm (Area corresponding to 1.2 is 0.3849 and corresponding to 2.0 is 0.4772)	NOV-2015 MECH
2.	Assuming that the diameter of 1000 brass plugs taken consecutively from machine form normal distribution with mean 0.7515cm and standard deviation 0.002.cm. How many plugs are likely to approved if acceptable diameter is 0.753±0.004cm? (Area corresponding to 2.25 is 0.4878 and corresponding to 1.75 is 0.4599)	[MAY-2016 MECH
3.	Assume the mean height of soldiers to be 68.22 inches with variance 10.8 inches. How many soldiers in a regiment of 10,000 would you expect to be over 6 feet tall, where the data is normally distributed.(Given : Area corresponding to 1.15 is 0.3749)	MAY-2015, CIVIL
4.	Given a normal distribution with μ=50 and σ=10, find the probability that assumes a value between 45 and 62. (Given P (z>0.5)=0.3085 P(z<1.2)=0.8849)	NOV-2015 CIVIL
5.	In a certain examination 2000 students appeared. Average marks obtained were 50% with standard deviation 5%.How many students do you expect to obtain more than 60% of marks, supposing that the marks are distributed	[comp May-14] Mech

		Dec 2017
	normally (Given z=2,A=0.4772)	
6.	In a distribution exactly normal 7% of the items are under 35 and 89% are under 63. Find the mean and standard deviation of the distribution using the following data.(Normal variate corresponding to 0.43 is 1.48 and corresponding to 0.39 is 1.23)	MAY-2014 MECH
7	The mean height of 1000 students at certain college is 165 cm and S.D. 10 cm. Assuming normal distribution, find the number of students whose height is greater than 172 cm.	May–2017 Mech
8	The lifetime of an article has a normal distribution with mean 400 hrs and standard deviation 50 hrs. Assuming normal distribution, find the expected number of articles out of 2000 whose lifetime lies between 335 hrs to 465 hrs.(Given: Z = 1.3, A = 0.4032).	May 18 Comp