Assignment – 1

Ex-1. A pair of dice is thrown 10 times. If getting a doublet (same number on both) is considered a success, Find the probability of
1) 4 successes. 2) No success.

Ex-2 The probability of a man hitting a target is $\frac{1}{4}$. If he fires 7 times, what is the probability of his hitting the target atleast twice.

Ex-3 If the probability that a man aged 60 will live to be 70 is 0.65 what is the probability that out of 10 man now 60 atleast 7 will live to be 70?

Ex-4 What is the probability of guessing correctly atleast 6 of 10 answers in a True-False objective test?

Ex-5 A merchant's file of 20 accounts contains 6 delinquent and 14 non-delinquent accounts. An auditor randomly selects 5 of these accounts for examination.
1) What is the probability that the auditor finds exactly 2 delinquent accounts?
2) Find the expected number of delinquent accounts in the sample selected.

Ex-6 Assume that half of the population is vegetarian so that the chance of an individual being a vegetarian is $\frac{1}{2}$. Assuming that 100 investigators each take sample of 10 individuals to see whether they are vegetarians; How many investigators would you expect to report that three people or less were vegetarian?

Ex-7 The mean and variance of a binomial distribution are 8 and 2 respectively. Find the probability that the variate takes values 1) less than or equal to 2.
2) greater than or equal to 7.

Ex-8 Assume that on the average one telephone number out of fifteen called bet^{n} 2 P.M. and 3 P.M. on week-days is busy. what is the probability that if 6 randomly selected telephone numbers are called
1) not more than three will be busy.
2) at least three of them will be busy?

Ex-9 If the probability that an individual suffers a bad reaction from a certain injection is 0.001, determine the probability that out of 2000 individuals.
1) exactly 3 will suffer a bad reaction
2) more than 2 individuals will suffer a bad reaction (given $\bar{e}^{2} = 0.136$)

Ex-10 It is known from past experience that in a certain plant there are on the average 4 industrial accidents per month. Find the probability that in a given year there will be less than 4 accidents by assuming poisson distribution ($\bar{e}^{4} = 0.0183$)

Ex-11 A manufacturer of blades knows that 5% of his product is defective if he sells blades in boxes of 100, and guarantees that not more than 10 blades will be defective, what is the probability that a box will fail to meet the guaranteed quality?

Ex-12. Find the probability that at most 5 defective components will be found in a lot of 200 if experience shows that 2% of such components are defective. Also find the probability of more than 5 defective components.

EX-13 suppose the waist measurements w of 800 girls are normally distributed with mean 66 cms and standard deviation 5 cms. Find the number N of girls with waists 1) bet^n 65 and 70 cms. 2) greater than or equal to 72 cms.

EX-14 A sales tax officer has reported that the average sales of the 500 business that he has to deal with during a year amount to Rs. 36,000 with a standard deviation of Rs. 10,000. Assuming that the sales in these business are normally distributed; Find

1) the number of businesses the sales of which are over Rs. 40,000
2) the percentage of businessess, the sales of which are likely to range between Rs. 30,000 and Rs. 40,000.
3) the probability that the sales of business selected at random will be over Rs. 30,000.

EX-15 The average test marks in a particular class is 79. The standard deviation is 5. If the marks are distributed normally, how many students in a class of 200 did not receive marks between 75 and 82 ?

EX-16 A set of examination marks is approximately normally distributed with a mean of 75 and S.D. of 5. If the top 5% of students get grade A and the bottom 25% get grade F, what mark is the lowest A and what mark is the highest F. ?

Ex-17 1) A normal distribution has 77.0 as mean Find its standard deviation if 20% of the area under the curve lies to the right of 90.0

2) A random variable has a normal distribution with 10 as standard deviation. Find its mean if the probability that the random Variable takes on a value less than 80.5 is 0.3264.

Ex-18 The sizes of components produced by a machine are normally distributed. It is required that the size should lie between 15.63 cm and 15.84 cm. It is found that 2.872% of the production is rejected for being over size. and 1.072% of the production is rejected for being undersize. Find the mean and standard deviation of the distribution of the component sizes.

Ex-19 A husband and wife appear in an interview for two vacancies in the same post. The probability of husband's selection is 1/7 and that of wife's selection is 1/5 what is the probability that

1) both of them will be selected.
2) only one of them will be selected.
3) none of them will be selected.

Ex-20: The incomes of a group of 10,000 persons were found to be normally distributed with mean Rs. 750 per month and S.D Rs. 50. show that of this group about 95% had income exceeding Rs. 668 and only 5% had income exceeding Rs. 832.