Home Assignments

1. Show that the probability of occurrence of only one of the events A and B is $P(A) + P(B) - 2P(AB)$.

2. In a large consignment of electric bulbs, 10% are defective. A random sample of 20 is taken for inspection. Using Binomial distribution find the probability that (i) all are good bulbs (ii) at most three are defective bulbs (iii) exactly three are defective bulbs.

3. An insurance company found that only 0.01% of the population is involved in a certain type of accident each year. If its 1000 policy-holders were randomly selected from the population, calculate the probability that more than two of its clients are involved in such an accident next year.

4. In a town 10 accidents took place in a period of 50 days. Using Poisson distribution, determine the probability that there will be 3 or more accidents per day.

5. The life time of battery cells is known to be normal with mean 12 hrs and standard deviation 3 hrs. Find the percentage of batteries which have life (i) between 10 hrs and 14 hrs (ii) more than 15 hrs (iii) less than 6 hrs. (Given: area under the standard normal curve between z=0 and z=0.67 is 0.2486, between z=0 and z=1 is 0.3413, between z=0 and z=2 is 0.4772.)

6. Given: $E(x) = 6$ and $E(x^2) = 68$ for a random variable X. Using Tchebycheff's inequality, find a lower bound for $P(5 < X < 11)$.