

**MANAV RACHNA UNIVERSITY, FARIDABAD**

**Department of Mathematics**

**Course: B.Tech(CST) Semester: IV Session: 2020-21 Subject: PAS**

Q.1 Delhi Trauma Centre receives on an average 4 seriously injured persons involved in road accidents every day. It is found that arrival of such persons follows a Poisson distribution. Calculate the probability that the Centre will receive exactly on person in a day.

[0.07328]

Q.2 Which probability distribution is appropriate to describe the situation where 100 misprints are distributed randomly throughout the 100 pages of a book? For this distribution, find the probability that a page selected at random will contain at least three misprints.

[0.0803]

Q.3 In a certain manufacturing process, 5% of the tools produced turn out to be defective. Find the probability that in a sample of 40%, at most 2 will be defective.

[0.675]

Q.4 If the probability of a defective bolt is 0.2 find (i) the mean and (ii) the standard deviation of the defective bolts in a total of 900 bolts.

[180; 13.4]

Q.5 On an average, five birds hit the Washington Monuments and are killed each week. Bill Garcy, an official of the National Park Service, has requested that Congress allocate funds for equipment to scare birds away from the monument. A congressional sub committee has replied that fund can not be allocated unless the probability of than three birds being killed in any week exceeds 0.7. Will the funds be allocated?

[0.7491]

Q.6 It has been observed by the National Highway Authority of India that the average number of accidents of NH -8 Gurgaon – Delhi section is 2 per week. Assuming that the number of accidents follows Poisson Distribution, calculate:

(i) the probability of no accident on this section of NH-8 during a one-week period;

(ii) the probability of at most three accidents on this section of NH – 8 during a two-week period.

[0.1353, 0.4332]

Q.7 Assuming that the typing mistakes per page committed by a typist follows a Poisson Distribution, find the expected frequencies for the following distribution of typing mistakes:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| No. of Mistakes per page | 0 | 1 | 2 | 3 | 4 | 5 |
| No. of Pages | 40 | 30 | 20 | 15 | 10 | 5 |

Q8.Six dice are thrown 729 times How many times do you expect atleast three dice to show a five or six. (Ans 233)

Q9.If 10 percent of the rivets produced by a machine are defective, find the probabilty that out of 5 rivets chosen at random (i) none will be defective (ii) one will be defective (iii) atleast two will be defective.

Q10. A bag contains 5 white ,7red,and 8 black balls . If four balls are drawn at random,one by one, with replacement ,what is the probability that (i) none is white (ii) all are white (iii) atleast one is white (iv) only two are white ?

Q11. In 800 families with 5 children each,how many families would be expected to have (i) 3 boys and 2 girls , (ii) 2 boys and 3 girls (iii) no girl (iv) at the most 2 girls

Q12.Fit a binomial distribution to the following frequency distribution:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| x | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| f | 13 | 25 | 52 | 58 | 32 | 16 | 4 |