Code No: 56086 **R09**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, November/December - 2020
PROBABILITY AND STATISTICS
(Bio-Technology)

Time: 2 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks
- - -

1.a) An integer is chosen at random from the first 200 positive integers. What is the probability that the integer chosen is divisible by 6 or by 8?
b) A box contains 4 balls. Two balls are drawn from it and are found to be white. Find the probability that all the balls in the bag are white. [7+8]

2. The diameter of an electric cable is assumed to be continuous random variable with probability density function $f(x) = 6x(1-x), 0 \le x \le 1$, Jusitfy. Find the mean and variance of the distribution. [15]

3.a) The mean and variance of a binomial distribution are 6 and 3 respectively. Find the mode of the binomial distribution.
b) In a normal distribution 31% of the items are under 45 and 8% are over 64. Find mean and variance of the distribution. [7+8]

4. A random sample of size 81 is taken from an infinite population having the mean 65 and standard deviation 10.
a) What is the probability that $\bar{X}$ will lie between 66 and 68?
b) What is the probability that X takes the values more than 85? [8+7]

5.a) Discuss the properties of a good estimator.
b) A random sample of 20 fuses subjected to overload has mean time for blow of 10.63 minutes with standard deviation 2.48 minutes. What can we assert with 95% confidence about the maximum error if we use $\bar{x}$=10.63 minutes as a point estimate of true average it takes such fuses for blow when subjected to overload. [5+10]

6.a) Discuss the test of significance procedure.
b) The average marks scored by 32 boys is 72 with a standard deviation of 8. While that for 36 girls is 70 with a standard deviation of 6. Does this indicate that the boys perform better than girls at level of significance 0.05? [6+9]

7. In one sample of 8 observations from a normal population, the sum of the squares of deviations of the sample values from the sample mean is 84.4 and in another sample of 10 observations it was 102.6. Test at 5% level whether the populations have the same variance. [15]

8. A PC repairman finds that the time spend on jobs has an exponential distribution with mean 30 minutes. If the sets are repaired in the order, in which they come in, and if the arrival of sets is approximately Poisson with an average of 10 per 8hour day, what is the repairman's expected idle time each day? How many jobs are ahead of the average set just brought in? [15]

---ooOoo---