Code No: 56086 **R09**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, May - 2019
PROBABILITY AND STATISTICS
(Bio-Technology)

Time: 3 hours **Max. Marks: 75**

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

1.a) State and prove Baye's theorem.
b) Suppose 5 men out of 100 and 25 women out of 10,000 are color blind. A color blind person is choosen at random. What is the probability of the person being a male? Assume male and female to be in equal numbers. [7+8]

2. For the continuous probability function $f(x) = kx^2e^{-x}$ when $x \geq 0$, find
a) k
b) Mean
c) Variance [5+5+5]

3.a) Number of monthly breakdowns of a computer is a random variable having Poisson distribution with mean equal to 1.8. Find the probability that the computer will function for a month (i) without a breakdown (ii) with only one breakdown and (iii) with at least one.
b) If a random variable X is defined as the sum of the number on the faces when two dice are thrown, find the mean and variance of X. [8+7]

4. Population consists of four numbers 2, 3, 4, 5. Consider all possible distinct samples of size two with replacement. Find
a) The population mean.
b) The population standard deviation (S.D).
c) The sampling distribution of means.
d) The mean of the sampling distribution of means.
e) The standard deviation of the sampling distribution of means. [15]

5.a) Briefly Explain point estimation and Interval estimation
b) A random sample of size 81 was taken whose variance is 20.25 and mean is 32, construct 98% confidence interval. [7+8]

6.a) A sample of 64 students have a mean weight of 70 kgs. Can this be regarded as a sample from a population with mean weight 56 kgs and standard deviation 25kgs.
b) The mean yield of two sets of plots and their variability are given below. Examine whether difference in the mean yields of the two acts of plots is significant. [7+8]

	Set of 40 plots	Set of 60 plots
Mean yield per plot	1258	1243
S.D per plot	34	28

7.a) The means of two random samples of sizes 9 and 7 are 196.42 and 498.82 respectively. The sum of the square of deviations from the mean are 26.92 and 18.73 respectively. Can the sample be considered to have been drawn from the same population?

b) Write the importance of t-distribution. [8+7]

8. Cars arrive at a petrol pump with exponential inter arrival times having mean ½ minute. The attendant takes an average of 1/5 minutes per car to supply petrol, the service time being exponentially disturbed. Determine

a) The average number of cars waiting to be served.

b) The average number of cars in the system and

c) The proportion of time for which the pump attended is idle. [15]

---ooOoo---