Code No: 56086 **R09**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2018
PROBABILITY AND STATISTICS
(Bio-Technology)

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

Answer any five questions
All questions carry equal marks
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1.a) A can hit a target 5 in 6 shots. B can hit 4 among 5. C can hit 3 among 4. What is the probability that two shots hit the target?

b) There are three boxes. Box-I contains 6 red balls and 4 white balls. Box II contains 5 red and 7 white balls. Box III contains 3 red and 9 white balls. Find the probability that the ball is [7+8]
i) Red ii) White

2.a) If $f(x)=Ke^{-|x|}$ is p. d.f in $-\infty \le x \le \infty$, find
i) K ii) the mean iii) Variance.

b) A die is thrown 6 times. Getting an even number is a success. Find the probability that there are
i) At least one success.
ii) ≤ 3 successes
iii) 4 successes. [7+8]

3.a) If x is a Poisson variate such that

$$3P(x=4)=\frac{1}{2}P(x=2)+P(x=0)$$

Find i) μ ii) $P(x\le 2)$ iii) $P(1\le x\le 4)$

b) In a sample of 1000 cases, the mean of a certain test is 14 and standard deviation is 2.5 Assuming the distribution to be normal, find
i) How many students score between 12 and 15.
ii) How many score above 18. [7+8]

4. A population consists of five numbers 2, 3, 6, 8, 11,.Consider all Samples of size two which can be taken without replacement from this population. Find
a) The population mean
b) The population Standard deviation
c) The mean of the sampling distribution of mean
d) Standard deviation of the sampling distribution of means. [15]

5.a) A sample of size 64 and mean 60 was taken from a population whose standard deviation is10.Construct 95% confidence interval for the mean.

b) A sample of 121 students is found to have a mean weight of 68 kgs. Can this be regarded as a sample from a population with mean weight 75 kgs. And standard deviation31 kgs. [7+8]

6.a) The mean height of 40 male students is 68 inches with a standard deviation of 3inches. The mean height of 60 female students is 66 inches with a standard deviation of 2.5 inches. Test the significance of the difference between the means at 95% level.

b) A sample of 1000 products are examined from a factory and 2.5% found to be defective. Another sample of 1500 similar products are examined and 2% found to be defective. Test the significance between the difference of two proportions at 5% level. [7+8]

7. 200 digits were chosen at random from a set of tables. The frequencies of the digits are

digits	0	1	2	3	4	5	6	7	8	9
Frequency	18	19	23	21	16	25	22	20	21	15

Use χ^2 test to assess the correctness of hypothesis that the digits were distributed in equal numbers in the table. [15]

8. The milk plant at a city distributes its products by trucks, loaded at the loading dock. It was its own fleet of trucks plus trucks of a private transport company. The trucks arrive at the interval of 20 minutes. The service time is 4 minutes. Find
a) The probability that there are more than or equal to 4 trucks in the queue
b) The waiting time of a truck in the queue.
c) The variance of queue length.
d) The probability that the waiting time will exeeds 10 minutes. [15]

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