R07

Code No: V0121

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year II Semester Examinations, December - 2017
PROBABILITY AND STATISTICS
(Common to CE, ME, CHEM, MCT)

Time: 3 hours **Max. Marks: 80**

Answer any five questions
All questions carry equal marks
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1.a) A can hit a target once in 5 shots. B can hit 2 among 3. C can hit one among 4. What is the probability that two shots hit the target?

b) A box I contains 7 red balls,3 black and 5 white balls. Box II contains 9 red, 2 black and 4 white balls, Box III contains 10 red, 5 black and 5 white balls. A box is chosen at random and a ball is drawn If it is black ball, what is the probability that it is from:
i) box I ii) box II iii) box III. [8+8]

2.a) A continuous Random variable has the p.d.f $f(x) = \begin{cases} K(1-x^2), & 1 \le x \le 4 \\ 0, & elsewhere \end{cases}$.
Determine: i) K ii) the mean iii) variance.

b) Six cards are drawn from a pack of 52 cards. Getting a red card is a success. Find the probability of getting the success:
i) At least once ii) 3 times iii) P(x < 3). [8+8]

3.a) The average number of accidents any day on a national highway is 1.6. Determine the probability that the number of accidents is:
i) At least one ii) At the most one

b) Suppose the weights of 400 male students are normally distributed with mean μ =60 kgs with a standard deviation of 9. Find the number of students whose weights are:
i) Between 50 and ii) less than 80. [8+8]

4. A population consists of six numbers.5,8,12,15 and 24 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 means
d) Standard deviation of the sampling distribution of means. [16]

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 deviation 31 kgs. [8+8]

6.a) In a certain factory there are two independent processes for manufacturing the same item. The average weight in a sample of 250 items produced from one process is found to be 120 gms with a standard deviation of 12 gms while the corresponding figures in a sample of 400 items from the other process are 124 and 14. Is there significant difference between the mean test at 5% 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. [8+8]

7. The following figures refer to the observations in independent samples.

Sample-I	25	30	28	34	24	20	13	32	22	38
Sample-II	40	34	22	20	31	40	30	23	36	17

Analyze whether the samples have been drawn from the populations of equal means. [16]

8. Workers come to tool store room to enquire about special tools. The average time between two arrivals is 90 seconds and the arrivals are assumed to be in Poisson distribution. The average service time is 50 seconds. Determine:
a) Average queue length
b) Average length of non empty queue
c) Mean waiting time of an arrival
d) Average waiting time of an arrival who waits. [16]

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