R09

Code No: F3104

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
MCA I Semester Examinations, June/July - 2018
PROBABILITY AND STATISTICS

Time: 3hrs **Max.Marks:60**

Answer any five questions
All questions carry equal marks
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1.a) A sub-committee of 6 members is to be formed out of a group consisting of 7 men and 4 women. Calculate the probability that the sub-committee will consist of (i) exactly 2 women and (ii) at least one women.

b) A, B and C wash 50%, 30% and 20% of the cars in a service station respectively. They fail to clean the glass in 5%, 7 % and 3% of the cars respectively. The glass of a washed car is checked. What is the probability that the glass has been cleaned? [6+6]

2.a) A random variable X takes the values 1, 2, 3,.....and $P(X=n)=1/2^n$, $n=1,2,3,....$ Find (i) $P(X$ is odd) (ii) $P(X\le 5)$ (iii) $P(X$ is divisible by 5).

b) A fair dice is rolled 5 times. Find the probability that 1 shows twice, 3 shows twice and 6 shows once. [6+6]

3.a) Determine the binomial distribution for which the mean is 4 and variance is 3. Also find $P(X=15)$.

b) Let X be normally distributed with mean 8 and standard deviation 4. Find
i) $P(5\le X\le 10)$ ii) $P(10\le X\le 15)$ iii) $P(X\ge 15)$. [6+6]

4.a) An insurance company has 25,000 automobile policy holders. If the yearly claim of a policy holder is a random variable with mean 320 and standard deviation 540, approximate the probability that the total yearly claim exceeds 8.3 million.

b) Let $X_1, X_2, X_3,.....X_n$ is an random sample from the population with respect to density function. $f(X)=\begin{cases} e^{-(x-Q)} & \text{for } x>Q \\ 0 & \text{otherwise} \end{cases}$. Show that $\overline{X}$ is an unbiased estimator of Q. Suggest an unbiased estimator of Q. [6+6]

5.a) A random sample of 200 tins of coconut oil gave an average weight of 4.95 kgs with a standard deviation of 0.21 kg. Do we accept the hypothesis of net weight 5 kgs per tin at1% level?

b) A sample of 10 house owners is drawn and the following values of their incomes are obtained. Mean Rs. 6,000; standard deviation Rs 650. Test the hypothesis that the average income of house owners of the town is Rs. 5,500. [6+6]

6.a) Time taken by workers in performing a job are given below.

Method I	20	16	26	27	23	22	
Method II	27	33	42	35	32	34	38

Test whether there is any significant difference between the variances at 5% level of significance of time distribution.

b) A sample analysis of examination results of 500 students was made. It was found that 220 students have failed, 170 have secured a third class, 90 have secured a second class and the rest, a first class. Do these figures support the general belief that the above categories are in the ratio 4: 3: 2:1 respectively? [6+6]

7.a) Fit a straight line to the following data:

Year:	1969	1970	1971	1972	1973	1974	1975	1976
Sales(in lakhs of Rs.):	38	40	65	72	69	60	87	95

b) A fair die is rolled n times. Let X be the number of 1's observed. let Y be the number 2's be observed. Find $Cov(X,Y)$ and $\rho(X,Y)$. [6+6]

8. Find the rank correlation coefficient for the following data:

x	92	89	87	86	86	77	71	63	53	50
y	86	83	91	77	68	85	52	82	37	57

[12]

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