Hall Ticket Number :										

Code: 4P2C13

R-14

M.C.A. I Semester Supplementary Examinations June 2019

Probability and Statistics

Max. Marks: 60 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60 Marks)

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UNIT–I

1. a) A random variable X has the following probability function

X	0	1	2	3	4	5	6	7	8
P(x)	$\frac{k}{45}$	$\frac{k}{15}$	$\frac{k}{9}$	$\frac{k}{5}$	$\frac{2k}{45}$	$\frac{6k}{45}$	$\frac{7k}{45}$	$\frac{8k}{45}$	$\frac{4k}{45}$

Determine (i) value of k (ii) mean (iii) variance of the distribution. 6M

b) A consulting firm rents cars from three agencies, 30% from D, 20% from E and 50% from F agencies. If 10%, 15% and 5% of the cars have bad tires respectively from agencies D, E and F, what is the probability that a car with bad tires rented by the firm came from agency E? 6M

OR

2. a) State and prove Bay's theorem 6M

b) For a continuous probability function $f(x) = k\,x^2\, e^{-x}$ when $x \geq 0$

find (i) k (ii) Mean (iii) Variance. 6M

UNIT–II

3. a) If 30 of 20 tyres are defective and 4 of them are randomly chosen for inspection, what is the probability that only one of the defective tyre will be included? 6M

b) If the variance of a Poisson variate is 3,then find the probability that

(i) *x=0* (ii) $0 < x \leq 3$ (iii) $1 \leq x \leq 4$. 6M

OR

4. a) Given that the switchboard of a consultant's office receives on the average 0.8 calls per minute. Find the probability that (i) there will be at least 2 calls (ii) at most 4 calls in a given minute. 6M

b) If a random variable 'X' follows a normal distribution with mean 16.28 and standard deviation 0.12. Find the probabilities

(i) $P(16 < X < 16.5)$ (ii) $P(X > 16.2)$. 6M

UNIT–III

5. A population consist of five numbers 2, 3, 6, 8, 11.consider all possible distinct Samples of Size 2 with replacement. Find

(i) Population Mean
(ii) Population standard deviation
(iii) Sampling distribution of mean
(iv) Mean of the sampling distribution of means
(v) Standard deviation of the sampling distribution of means.
(vi) Verify sampling distribution of mean and variance by suitable formula. 12M

OR

6. a) The mean and the standard deviation of a population are 11,795 and 14054 respectively. If n=50, find the 95% confidence interval for the mean. 6M

   b) Explain Maximum error of estimate E for large sample. 6M

UNIT–IV

7. a) Write about (i) Critical region (ii) Left tail test and right tail test (iii) Two tailed test 6M

   b) A manufacturer claims that only 4% of his products are defective .A random sample of 500 were taken among which 100 were defective. Test the hypothesis at 0.05 level. 6M

OR

8. a) In a college of 600 students of a certain college 400 are found to use ball pens. In another college of 900 students, 450 were found to use ball pens. Test whether the two colleges are significantly different with respect to the habit of using ball pens. 6M

   b) A random sample from a company's very extensive files shows that the orders for a certain kind of machinery were filled, respectively in 10, 12, 19, 14, 15, 18, 11,and 13 days. Use $\alpha = 0.01$ to test the claim that on the average such orders are filled in 10.5 days. 6M

UNIT–V

9. Three samples of each of size 5 were drawn from three uncorrelated normal populations with equal variance. Test the hypothesis that the population means are equal at 5% level.

Sample 1	10	12	9	16	13
Sample 2	9	7	12	11	11
Sample 3	14	11	15	14	16

12M

OR

10. a) Explain two way ANOVA Technique. 6M

    b) Explain coding method 6M

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