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Register Number:

Name of the Candidate:

B.Sc. DEGREE EXAMINATION December 2014

(CONSTRUCTION MANAGEMENT)

(THIRD SEMESTER)

310: PROBABILITY AND STATISTICS

Time: Three hours Maximum: 75 marks

Answer ONE FULL question from each UNIT **(5 × 15 = 75)**

UNIT-I

1. a) Urn-I has 2 white and 3 black balls. Urn-II has 4 white and I black and Urn-III has 3 white and 4 black balls. An Urn is selected at random and a ball drawn at random is found to be white. Find the probability that it comes from Urn-I.

   b) The density function of a random variable 'X' is given by $f(x)=kx(2-x)$, $0 \le x \le 2$. Find K and mean.

(OR)

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

x:	0	1	2	3	4	5	6	7
P(x):	0	k	2k	2k	3k	k^2	$2k^2$	$7k^2+k$

   (i) Find k, (ii) Find $P(0<x<5)$

   b) A random variable has the pdf given by $f(x) = 2e^{-2x}$, $x \ge 0$ find the m.g.f

UNIT-II

3. a) For a binomial distribution mean is 6 and S.D. is $\sqrt{2}$, find the first two terms of the distribution.

   b) Find the m.g.f. of Poisson distribution, hence find mean of Poisson distribution.

(OR)

4. a) Fit a Poisson distribution for the following data:

x:	0	1	2	3	4	5
f:	142	156	69	27	5	1

   b) Define Normal distribution.

UNIT-III

5. a) In a sample of 400 parts manufactured by a factory, the number of defective parts was found to be 30. The company, however claimed that only 5% of their product is defective. Is the claim acceptable?

   b) The nicotine contents in two samples of tobacco were found to be as follows:

Sample A:	24	27	26	21	25	
Sample B:	27	30	28	31	22	36

can it be said that two samples come from same normal population.

(OR)

6. a) Certain pesticide is packed into bags by a machine. A random sample of 10 bags is drawn and their contents are found to weigh as follows 50, 49, 52, 44, 45, 48, 46, 45, 49, 45. Test if the average packing can be taken to be 50kg.

   b) The theory predicts the proportion of beans, in the four groups A, B, C, and D should be 9:3:3:1. In an experiment with 1600 beans the numbers in the four groups were 882, 313, 287 and 118. Does the experimental result support the theory?

UNIT-IV

7. a) A tea company appoints four salesman A, B, C and D and observes their sales in three seasons summer, winter and monsoon. The figure (in lakhs) are given in the following table.

	Salesman			
Seasons	A	B	C	D
Summer	36	36	21	35
Winter	28	29	31	32
Monsoon	26	28	29	29

   (i) Do the salesman significantly differ in performance?

   (ii) Is there significant difference between the seasons?

(OR)

8. a) Analyse the following results of a Latin Square experiments.

	I	II	III	IV
1	A(12)	D(20)	C(16)	B(10)
2	D(18)	A(14)	B(11)	C(14)
3	B(12)	C(15)	D(19)	A(13)
4	C(16)	B(11)	A(15)	D(20)

The letters A, B, C, D denote the treatments and the figures in brackets denote the observations.

UNIT-V

9. Explain in detail the characteristics and classification of queuing models.

(OR)

10. Customer arrive at a watch repair shop according to a Poisson process at a rate of one per every 10 minutes and the service time is exponential random variable with mean 8 minutes. Find the average number of customers, the average waiting time, a customer spends in the shop, the average time a customer spends in the waiting for service.
