Code :9FBS101

MCA I Semester Regular & Supplementary Examinations, February 2011
PROBABILITY & STATISTICS
(For students admitted in 2009 & 2010 only)

Time: 3 hours **Max Marks: 60**

Answer any FIVE questions
All questions carry equal marks

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1. (a) State and prove the Baye's theorem of probability.
   (b) Box 'A' contains 5 red and 3 white marbles and Box 'B' contains 2 red and 6 white marbles. If a marble is drawn from each box, what is the probability that they are both of same colour.

2. (a) If X is a continuous random variable and K is a constant them prove that
   (i) Var (X+K)=Var(X) (ii) Var (KX)=K^2Var(X)
   (b) Find the mean and variance of the uniform probability distribution given by
   f(x)=1/n for x=1,2,- - - - - - - - - n.

3. (a) Fit a binomial distribution for the following data and compare the theoretical frequencies with the actual ones

X:	0	1	2	3	4	5
F:	2	14	20	34	22	8

   (b) Given that the mean heights of students in a class 158 cms with standard deviation of 20cms. Find how many students heights lie between 150 cms and 170 cms, if there are 100 students in the class.

4. A population consists of five numbers 2,3,6,8 and 11. Consider all possible samples of size 2 that can be drawn with replacement from this population. Find
   (a) The mean of the population
   (b) The standard deviation of the population
   (c) The mean of the sampling distribution of mean and
   (d) The standard deviation of the sampling distribution of means.

5. (a) A random sample of 100 teachers in a large metropolitan area revealed a mean weekly salary of Rs 487 with a standard deviation Rs 48. With what degree of confidence can we assert that the average weekly salary of all teachers in the metropolitan area is between 472 to 502?
   (b) Find 95% confidence limits for the mean of a normality distributed population from which the following sample was taken, 15, 17, 10, 18, 16, 9, 7, 11, 13, 14.

6. (a) A manufacturer claimed that atleast 95% of the equipment which he supplied to a factory conformed to specifications. An examination of a sample of 200 pieces of equipment revealed that 18 were faulty. Test his claims at 5% level of significance.
   (b) In a random sample of 400 adults and 600 teenagers who watched a certain television programme, 100 adults and 300 teenagers indicated that they liked it. Construct 99% confidence limits for the difference in proportions of all adults and all teenagers who watched the programme and liked it.

7. (a) Find the maximum difference that we can expect with probability 0.95 between the means of samples of sizes 10 and 12 from a normal population if their standard deviation are found to be 2 and 3 respectively.
   (b) The following table gives the classification of 100 workers according to sex and nature of work. Test whether the nature of work is independent of the sex of the worker.

8. (a) Fit a parabolic curve to the below data

X:	1.0	1.5	2.0	2.5	3.0	3.5	4.0
Y:	1.1	1.3	1.6	2.0	2.7	3.4	4.1

   (b) Find the rank correlation for the following data

x:	56	42	72	36	63	47	55	49	38	42	68	60
y:	147	125	160	118	149	128	150	145	115	140	152	155.

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