

**Model Question Paper**  
**Seventh Semester B.Tech Degree Examination**  
**2013 Scheme**  
**13.705.4 STATISTICAL REASONING (Elective – 1) (F)**

Time : 3 hrs

Max marks: 100

**PART A**

**(All questions are compulsory. Each question carries 4 marks)**

1. Explain role type classification with respect to scatter plots.
2. What is meant by stratified sampling?
3. Distinguish between discrete and continuous random variables.
4. 500 values are normally distributed with a mean of 125 and a standard deviation of 10.
  - a) What percent of the values lies in the interval 115-135?
  - b) What percent of the values lies in the interval 100-150?
  - c) What interval about the mean includes 95% of the data?
  - d) What interval about the mean includes 50% of the data?
5. Find the least sample size population required if the length of the 95% confidence interval for the mean of a normal population with standard deviation 8 should be less than 10.

**PART B**

**( Answer one full question out of the two from each module. Each question carries 20 marks.)**

Module - I

6. Distinguish between the distributions of categorical variable and quantitative variable. Illustrate it with the help of examples using graphical representations and numerical measures.
7. Explain histograms and stemplots.

Module – II

8. Distinguish between different types of sampling plans with proper examples.
9. Briefly explain causational and observational studies with the help of suitable examples.

### Module – III

10. Explain sampling distributions with respect to sample proportion and sample mean.
11. Suppose the proportion of all college students who have used drugs in the past 6 months is  $p = 0.40$ . For a class of  $n = 200$ , that is representative of the population of all students on drugs consumption, what is the probability that the proportion of students who have consumed drugs in the past 6 months is less than 0.32?

### Module – IV

12. Explain statistical inference with respect to point estimation, interval estimation and hypothesis testing.
13. a) A random sample of 900 members is found to have a mean of 4.45 cms. Can it be regarded as a sample from a large population whose mean is 5 cm and variance is 4 cm?  
b) In a random sample of 450 industrial accidents, it was found that 230 were due to unsafe working conditions. Construct 95% confidence interval for the corresponding true proportion.