

M.E. (Electronics and Communication Engineering)  
Third Semester  
ECE-1307: Research Methodology

Time allowed: 3 Hours

Max. Marks: 50

**NOTE:** Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit. All questions carry equal marks.

x-x-x

I. Attempt the following:-

- a) What do you mean by research?
- b) What is the necessity of defining a research problem?
- c) What can be the objectives of research?
- d) What are the limitations of secondary data collection?
- e) What are the features of a research design?
- f) List down the advantages of observation method of data collection.
- g) What are the guiding considerations in the construction of questionnaire?
- h) Describe the precautions that the researcher should take while interpreting the findings?
- i) What are the precautions to be taken while writing a research report?
- j) Explain the meaning of Research Hypothesis in context of research design.

**UNIT - I**

- II. a) What do you mean by research? Classify different types of research with the help of suitable examples.  
b) Differentiate between exploratory and descriptive research design.
- III. a) What do you mean by Sample Design? Discuss different types of sampling techniques with the help of suitable examples.  
b) Explain the steps in developing a research plan.
- IV. a) What should be the size of the sample if a simple random sample from a population of 4000 items is to be drawn to estimate the percent defective within 2 percent of the true value with 95.5 percent probability? Value of  $p = 0.02$ .  $z = 2.005$  (as per table of area under normal curve for the given confidence level of 95.5%).  
b) Calculate the size of sample for infinite population in the given question.



(2)

**UNIT - II**

- V. a) Discuss different methods of collecting data with the help of suitable examples. Differentiate between Observation and Interview.  
b) Discuss various kinds of charts and diagrams used in data analysis. Elaborate the use of SPSS in data analysis.
- VI. Explain the meaning of analysis of variance. Describe briefly the technique of analysis of variance for one way and two way classifications.
- VII. a) Explain the terms arithmetic mean, median, mode, geometric mean and harmonic mean.  
b) Find out the standard deviation for the following data 17,13,15,17,25,21,23.

x-x-x