



**Institute of Mathematical Sciences  
Master of Science in Statistics  
End of Semester Examination  
STA 8326 - Survey Research Design**

**Date: 30/08/2021**

**Duration: 3 Hours**

**Instructions:**

1. Answer **Question 1** and **any other two** questions.
2. Show all your workings clearly in the answer sheet.

**Question 1 (30 Marks)**

- (a) Define the following terms as used in survey research design:
- (i) Probability proportional to size sampling [2 marks]
  - (ii) Design effect [2 marks]
  - (iii) Sampling frame [2 marks]
- (b) Define research methods and methodology. What is the major difference between them? [6 marks]
- (c) Research designs are divided into qualitative, quantitative, and mixed methods, explain what these designs are and what research purposes they serve. [12 marks]
- (d) What is a conceptual framework? How significant is it to the design of a research proposal. [6 marks]

**Question Two (15 Marks)**

- (a) Describe procedures for optimal item construction in survey research, and procedures for obtaining a high response rate. [7 marks]
- (b) Discuss the similarities and differences among grounded theory designs, ethnographic designs, and narrative designs. Define each carefully, and provide examples. Why might there be considerable overlap among these categories? [8 marks]

**Question Three (15 Marks)**

- (a) Explain the difference between *cumulative total method* and *Lahiri's method* of sampling under probability proportional to size scheme. [4 marks]
- (b) Consider the following data set of 12 number of workers in the factory and its output.

Factory Number	Number of Workers (X) (in '000s)	Industrial Production (Y) (in metric tons)
1	2	30
2	5	60
3	10	12
4	4	6
5	7	8
6	2	13
7	3	4
8	14	17
9	11	13
10	6	8
11	7	9
12	15	6

Obtain a sample of size 7 using:

- (i) Cumulative total method [6 marks]
- (ii) Lahiri's method [5 marks]

**Question Four (15 Marks)**

Briefly describe the following techniques of addressing non-response in sample survey research:

- (a) *Hansen* and *Hurwitz* call-back technique. [4 marks]
- (b) *Deming's* technique. [6 marks]
- (c) *Politz* and *Simmon's* technique. [5 marks]

**Question Five (15 Marks)**

- (a) Differentiate between longitudinal and cross-sectional research designs citing an example in each case. [4 marks]
- (b) Define the following terms as used in survey research design:
- (i) Case study design. [1 mark]
- (ii) Experimental research design. [2 marks]
- (iii) Exploratory research design. [2 marks]
- (c) Outline *two* advantages of each design in (b) above. [6 marks]