



University of Kelaniya - Sri Lanka

External Examinations Branch

**Bachelor of Arts (General) Degree Third Examination (External) – 2009
August / September 2010**

Faculty of Social Sciences

Social Statistics– SOST – E3015

Sampling Methods

Answer any four (04) questions only

No. of questions : 07

Time : Three hours

01.
 - i. Explain the difference between sample and population.
 - ii. What is a sample survey? In what respect is it superior to a census?
 - iii. Discuss briefly the basic principles of a sample survey.
 - iv. What are the limitations of Sampling?

02.
 - i. What are the main steps involved in a sample survey? Discuss them briefly.
 - ii. What are the errors and different sources of errors in sample survey?
 - iii. Describe briefly how these errors can be controlled.

03.
 - i. What do you mean by Probability sampling and Non-Probability sampling?
 - ii. Mention briefly the various methods of probability sampling and non-probability sampling.
 - iii. What are the advantages of probability sampling over non – probability sampling?

04. i. What is a simple random sample? Describe the various methods of drawing a random sample with examples.
- ii. What are the merits and drawbacks of simple random sampling?
05. Signature to a petition were collected on 676 sheets. Each sheet had enough space for 42 signatures, but on many sheets a smaller number of signatures had been collected. The numbers of signatures per sheet were counted on a random sample of 50 sheets, with the results shown bellow.

y_i	42	41	36	32	29	27	23	19	16	15
f_i	23	4	1	1	1	2	1	1	2	2

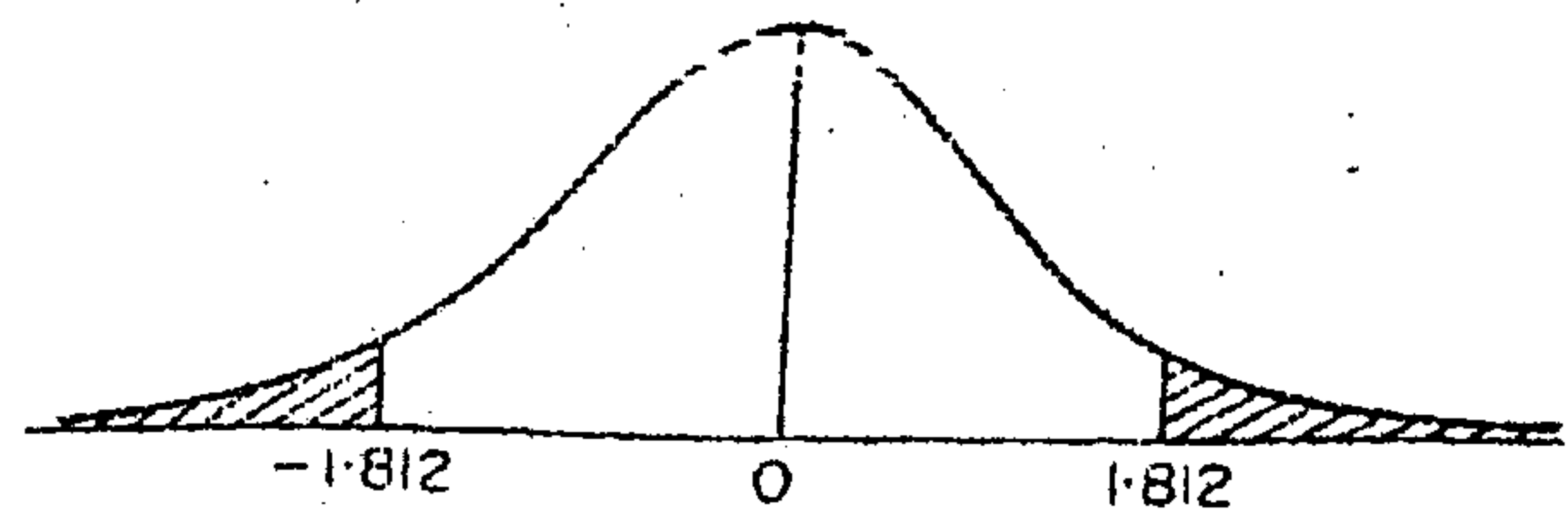
y_i	14	11	10	9	7	6	5	4	3	Total
f_i	1	1	1	1	1	3	2	1	1	50

Where, y_i = Number of signature

f_i = Frequency

- i. Find an estimate for the average number of signatures in a sheet, and the 95% confidence limits.
- ii. Estimate the total number of signatures to the petition and the 95% confidence limits.
06. i. What is meant by stratified random sample. Under what conditions is stratified random sampling preferred to simple random sampling?
- ii. Describe the advantages of stratified random sampling with illustrations.

Table 2. Percentage Points of the *t* Distribution



Example
 For $\nu = 10$ degrees of freedom:
 $P(t > 1.812) = 0.05$
 $P(t < -1.812) = 0.05$

$\nu \backslash \alpha$.25	.20	.15	.10	.05	.025	.01	.005	.0005
1	1.000	1.376	1.963	3.078	6.314	12.706	31.821	63.657	636.619
2	.816	1.061	1.386	1.886	2.920	4.303	6.965	9.925	31.598
3	.765	.978	1.250	1.638	2.353	3.182	4.541	5.841	12.941
4	.741	.941	1.190	1.533	2.132	2.776	3.747	4.604	8.610
5	.727	.920	1.156	1.476	2.015	2.571	3.365	4.032	6.859
6	.718	.906	1.134	1.440	1.943	2.447	3.143	3.707	5.959
7	.711	.896	1.119	1.415	1.895	2.365	2.998	3.499	5.405
8	.706	.889	1.108	1.397	1.860	2.306	2.896	3.355	5.041
9	.703	.883	1.100	1.383	1.833	2.262	2.821	3.250	4.781
10	.700	.879	1.093	1.372	1.812	2.228	2.764	3.169	4.587
11	.697	.876	1.088	1.363	1.796	2.201	2.718	3.106	4.437
12	.695	.873	1.083	1.356	1.782	2.179	2.681	3.055	4.318
13	.694	.870	1.079	1.350	1.771	2.160	2.650	3.012	4.221
14	.692	.868	1.076	1.345	1.761	2.145	2.624	2.977	4.140
15	.691	.866	1.074	1.341	1.753	2.131	2.602	2.947	4.073
16	.690	.865	1.071	1.337	1.746	2.120	2.583	2.921	4.015
17	.689	.863	1.069	1.333	1.740	2.110	2.567	2.898	3.965
18	.688	.862	1.067	1.330	1.734	2.101	2.552	2.878	3.922
19	.688	.861	1.066	1.328	1.729	2.093	2.539	2.861	3.883
20	.687	.860	1.064	1.325	1.725	2.086	2.528	2.845	3.850
21	.686	.859	1.063	1.323	1.721	2.080	2.518	2.831	3.819
22	.686	.858	1.061	1.321	1.717	2.074	2.508	2.819	3.792
23	.685	.858	1.060	1.319	1.714	2.069	2.500	2.807	3.767
24	.685	.857	1.059	1.318	1.711	2.064	2.492	2.397	3.745
25	.684	.856	1.058	1.316	1.708	2.060	2.485	2.787	3.725
26	.684	.856	1.058	1.315	1.706	2.056	2.479	2.779	3.707
27	.684	.855	1.057	1.314	1.703	2.052	2.473	2.771	3.690
28	.683	.855	1.056	1.313	1.701	2.048	2.467	2.763	3.674
29	.683	.854	1.055	1.311	1.699	2.045	2.462	2.756	3.659
30	.683	.854	1.055	1.310	1.697	2.042	2.457	2.750	3.646
40	.681	.851	1.050	1.303	1.684	2.021	2.423	2.704	3.551
60	.679	.848	1.046	1.296	1.671	2.000	2.390	2.660	3.460
120	.677	.845	1.041	1.289	1.658	1.980	2.358	2.617	3.373
∞	.674	.842	1.038	1.282	1.645	1.960	2.326	2.576	3.291

Source: This table is abridged from Table III of Fisher & Yates: *Statistical Tables for Biological, Agricultural and Medical Research* published by Oliver & Boyd Ltd., Edinburgh, and by permission of the authors and publishers.

07.
 - i. Define systematic sampling.
 - ii. Discuss its advantages and disadvantages.
 - iii. Compare the following pair of concepts briefly.
 - a. Parameters and statistics
 - b. Questionnaire and schedule
