

THE OPEN UNIVERSITY OF SRI LANKA
 DEPARTMENT OF SOCIAL STUDIES
 BA DEGREE IN SOCIAL SCIENCES – LEVEL 4 & 5
 FINAL EXAMINATION – SEMESTER II - 2018/19
 SSE 3106/ DSE5301 - STATISTICS FOR SOCIAL SCIENCES



DURATION: THREE HOURS (03 HOURS)

Date: 03.08.2019

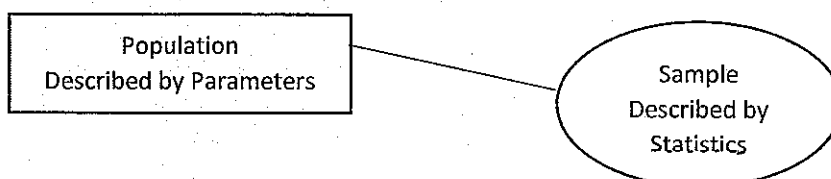
Time: 1.30 p.m. – 4.30 p.m.

Instructions:

- Non-programmable calculator is allowed
- Answer five (5) questions **selecting at least two questions from each part**
- Each question carries equal marks.

Part I

1. "Statistics refers to a set of statistical procedures for organizing, summarizing and analyzing information". Explain this statement with an example.
2. (a) Explain the following diagram with an example.



- (b) Provide two examples each for nominal, ordinal, and ratio data.
3. (i) Explain when to use a bar graph, histogram, and line graph with an example for each.
- (ii) The annual imports of a selected group of electronic suppliers are shown in the following frequency distribution.

Imports (Rs. millions) and Number of Suppliers

Imports	No. of suppliers
2-5	6
5-8	13
8-11	20
11-14	10
14-17	1

- (a) Draw a histogram.
- (b) Draw a frequency polygon.
- (c) Summarize the important features of the distribution

4. The following table shows the number of times people in a sample group visited the cinema in a six-month period.

One of the frequencies is missing.

Cinema Visits	Frequency	Midpoint
0-4	20	2
5-9	24	7
10-14		12
15-19	7	17

Midpoints are used to work out an estimate for the mean number of visits. The mean is calculated to be 7.25.

- Work out the missing frequency.
- Calculate the standard deviation
- Interpret the result

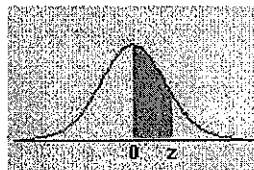
Part II

5. (a) Draw the figure (s) and represent the area (s) for the followings and then
- Find the area under the normal distributing curve between $Z = 0$ and $Z = 1.54$.
 - Find the area to the right of $Z = 2.11$
 - Find the area between $Z = -2.00$ and $Z = -1.47$
 - Find the area to the right of $Z = +1.43$ and to the left of $Z = -2.01$
- (b) A national achievement test is administered annually to 3rd graders. The test has a mean score of 100 and a standard deviation of 15. If John's z-score is 1.20, what was her score on the test?
- Hint: $z = (X - \mu) / \sigma$
6. (a) A bank calculates that its individual savings accounts are normally distributed with a mean of Rs 2000 and a standard deviation of Rs. 600. If the bank takes a random sample of 100 accounts, what is the probability that the sample mean will lie between Rs.1,900 and Rs. 2050?
- (b) Suppose we want to estimate the average weight of an adult male in Mountlab County, Georgia. We draw a random sample of 1,000 men from a population of 1,000,000 men and weigh them. We find that the average man in our sample weighs 180 pounds, and the standard deviation of the sample is 30 pounds. What is the 95% confidence interval?

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7. Explain the following concepts and give an example for each.
- Null and alternative hypotheses.
 - A type I error and a type II error
 - a p value and an alpha value (α)
 - A one-tailed and a two – tailed test
8. The income distribution of the population of a certain village has a mean of Rs. 6000 with a standard deviation of Rs. 180. Could a sample of 64 persons with a mean income of Rs.5950 belong to this population? Test this at 5 % level of significance with using p value.
9. Write short notes on any four (04) of the following with an example for each.
- Point estimate and confidence Interval
 - Standard error of the mean
 - Bell -shaped distribution curve and its empirical rule
 - Positively Skewed and negatively Skewed distributions
 - Critical region and noncritical region

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Standard Normal (Z) Table
Area between 0 and z



	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.2	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.1480	0.1517
0.4	0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
0.5	0.1915	0.1950	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.2190	0.2224
0.6	0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2517	0.2549
0.7	0.2580	0.2611	0.2642	0.2673	0.2704	0.2734	0.2764	0.2794	0.2823	0.2852
0.8	0.2881	0.2910	0.2939	0.2967	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
0.9	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
1.0	0.3413	0.3438	0.3461	0.3485	0.3508	0.3531	0.3554	0.3577	0.3599	0.3621
1.1	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
1.2	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.3980	0.3997	0.4015
1.3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4761	0.4767
2.0	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.1	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
2.2	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6	0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4963	0.4964
2.7	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974
2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.4980	0.4981
2.9	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3.0	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.4990	0.4990