THE OPEN UNIVERSITY OF SRI LANKA
DEPARTMENT OF SOCIAL STUDIES
BA IN SOCIAL SCIENCES – 2024/2025
BA IN YOUTH & COMMUNITY DEVELOPMENT – 2024/2025
FINAL EXAMINATION – LEVEL 4 & 5 (SEMESTER II)
DSE5301- STATISTICS FOR SOCIAL SCIENCES

DURATION: THREE (03) HOURS ONLY

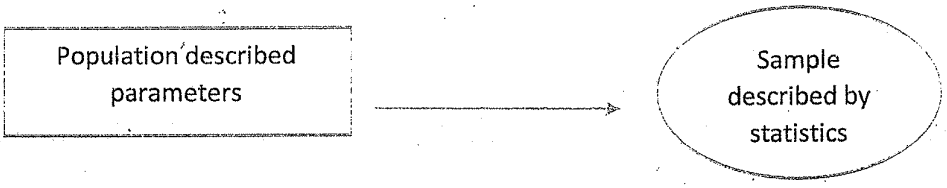
Date: 17.08.2025 **Time: 1.30.p.m. - 4.30.p.m**

Instructions:

- **Answer any FIVE (05) questions.**
- **Each question carries equal marks.**
- **Use of non –programmable calculators is allowed.**

1. (a) " Statistics refers to the art of learning from data and the use of statistical procedures for organizing, summarizing, and analyzing information from the data." Explain this statement with examples. (10 marks)

(b) Explain the following diagram with an example. (10 marks)



2. (a) Why are levels of measurement important in social statistics? (10 marks)

(b) Indicate which scale of measurement is being used? (02 marks each)

1. Income measured in Sri Lankan Rupees.
2. Baking temperature for various main dishes: 350,400, 325,250,300.
3. The distance in miles to the closest city center
4. The heights of 25-75 years old women.
5. What socio economics status is most representative of you?

3. The number of students registered in a university under their respective degree programs.

Degree program	No. of students
Management	600
Science	400
Engineering	200
Arts	800

(a) Using the above information, construct a pie chart.

(b) Which degree program has the highest number of registered students?

(c) What percentage of students are enrolled in the Science degree program?

(d) What percentage of students are enrolled in the Engineering degree program?

(20 marks)

4. Following grouped data is presented by measuring the heights of children into closest centimeters.

Height (cm)	0-10	10-15	15-20	20-25	25-30	30-35
Frequency	5	4	13	20	12	6

Find the value of range, mean, variance, standard deviation and shape of distribution.

(04 marks each)

5. a) Discuss the characteristics of a normal or bell-shaped curve (05 marks)

b) Find the appropriate area, using Z table.

1. Find the area under the normal distributing curve between Z= 0.34 and Z= 1.75
2. Find the area to the left of Z=1.43
3. Find the area to the right of Z=2.5
4. Find the area to the left of Z= 1.96
5. Find the area under the normal distributing curve between Z= -0.81 and Z= 0.56

(15 marks)

6. (a) The average monthly mortgage payment including principal and interest is Rs. 982 in Sri Lanka. If the standard deviation is approximately Rs .180 and the mortgage payments are approximately normally distributed , find the probability that a randomly selected monthly payment is,

(i) More than Rs.1000

(ii) More than Rs.475

(iii)Between Rs 800 and Rs 1150 (04 marks each)

(b) The average number of calories in a 1.5 –ounce chocolate bar is 225. Suppose that the distribution of calories is approximately normal distribution with standard deviation is 10. Find the probability that a randomly selected chocolate bar will have

(i) Between 200 and 220 calories

(ii) Less than 200 (04 marks each)

7. A. research firm conducted a survey to determine the average (mean) amount of money steady smokers spend on cigarettes during a week. A sample of 49 steady smokers reveled the sample mean =Rs.20 and the sample standard deviation Rs.5.

(a) What is the point estimate and explain what it indicates.

(b) Calculate the standard error of the mean.

(c) Estimates the confidence limits of the mean of money steady smokers and interpret the results.

(i) With 95 percent confidence
(ii) With 90 percent confidence
(iii) Confidence length (CI) for (I) and (ii) (04 marks each)

8. (a) What are the procedure for testing a hypothesis?

(b) What is meant by a type I error? A type II error?

(c) What is meant by the critical region?

(d) What is meant by the level of significance?

(05 marks each)

9. Write short notes on **any <u>four (04)</u>** of the following.

(a) Interval estimate

(b) Characteristics of good estimator

(c) The standard normal distribution

(d) Variations in normal distributions

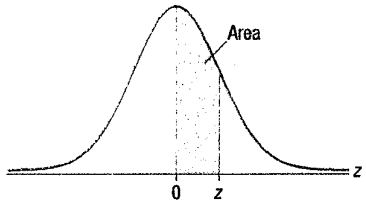
(e) Measure of Variability

(f) Hypothesis testing

(05 marks each)

Standard Normal Distribution

Numerical entries represent the probability that a standard normal random variable is between 0 and z where $z = \frac{x-\mu}{\sigma}$.



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
3.1	0.4990	0.4991	0.4991	0.4991	0.4992	0.4992	0.4992	0.4992	0.4993	0.4993
3.2	0.4993	0.4993	0.4994	0.4994	0.4994	0.4994	0.4994	0.4995	0.4995	0.4995
3.3	0.4995	0.4995	0.4995	0.4996	0.4996	0.4996	0.4996	0.4996	0.4996	0.4997
3.4	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4998