



GWANDA STATE UNIVERSITY
FACULTY OF NATURAL RESOURCES MANAGEMENT AND AGRICULTURE
DEPARTMENT OF CROP SCIENCE
BACHELOR OF SCIENCE HONOURS DEGREE IN CROP SCIENCE
LCS 1207 INTRODUCTION TO STATISTICS
SECOND SEMESTER EXAMINATION
MAY 2023

LCS 1207 Introduction to statistics

Time Allowed: 3 Hours

Total Marks: 100

Special Requirements: A scientific calculator

Examiner's Name: Dr. P. Zanamwe

INSTRUCTIONS

1. Answer **all** questions in Section A
2. Answer **TWO (2)** questions in Section B
3. Find Appendix 3 for t -table

MARK ALLOCATION

QUASTION	MARKS
SECTION A	60
SECTION B	40
TOTAL ATTAINABLE MARKS	100

SECTION A: ANSWER ALL QUESTIONS IN SECTION A

QUESTION ONE

- a) Define the following words as they apply to statistics:
- i) Population (2 Marks)
 - ii) Parameters (2 Marks)
 - iii) Sample (2 Marks)
 - iv) Sampling unit (2 Marks)
 - v) Census (2 Marks)
- b) Distinguish probability sampling from non-probability sampling and give THREE (3) examples of each (10 Marks)

QUESTION TWO

- a) A scientist interested in finding out the age groups of people interested in farming in Matabeleland South province in Zimbabwe went to a farmer union and collected the following data:

7 1 22 38 12 1 14 26 20 15 2 34 12 18 24
5 8 2
19 1 29 21 32 1 17 24 13 25 2 15 31 11 16
4 2 0
23 3 19 14 28 2 9 16 22 39 1 25 19 14 31
9 0 3

- i. Summarise the age group information in a stem and leaf plot. (5 Marks)
 - ii. Use the stem and leaf plot to comment on the age group of people who are interested in farming in Matabeleland South province in Zimbabwe. (5 Marks)
- b) The table below show grouped test marks for the students studying introduction to statistics at Gwanda State University.

Test mark, x	5 -10	10 -15	15 -20	20 -25	25 -30
Frequency	3	5	7	2	4

- i) Identify the modal class (2 Marks)

(8 Marks)

Employee bonuses earned by farm workers in a recent month (US\$) were:

From the data above, find the

- SECTION B: ANSWER ANY TWO QUESTIONS IN SECTION B**

Study the fees payment method by gender in Table 6.1 and complete Table 6.2.

(20 Marks)

Payment Method	Gender		Total
	Male	Female	
Credit Card	10	15	25
Cash	8	6	14

Total	18	21	39
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Table 6.2. Events, probability type and the probability of events.

Events	Probability type	Probability
Female and uses a credit card?		
Male and uses cash		
Credit card user?		
Female?		
Female given that she uses cash?		

QUESTION FIVE

Explain giving specific examples the following data scales:

- i. Nominal (5 Marks)
- ii. Ordinary (5 Marks)
- iii. Interval (5 Marks)
- iv. Ratio (5 Marks)

QUESTION SIX

The mean yield of a standard linseed variety when grown in Zimbabwe is 2.0 t/ha. The yields obtained from a random sample of SIX (6) plots sown with a new variety in the same region were 2.6, 2.1, 2.5, 2.4, 1.9, and 2.3 t/ha. Do these results provide sufficient evidence to conclude that the yield of the new variety is different from the standard? (20 Marks)

Appendix 3

Percentage Points of the t -distribution

df	Percentage in top tail						
	10	5	2.5	1	0.5	0.1	0.05
1	3.078	6.314	12.71	31.82	63.66	318.3	636.6
2	1.886	2.920	4.303	6.965	9.925	22.33	31.60
3	1.638	2.353	3.182	4.541	5.841	10.21	12.92
4	1.533	2.132	2.776	3.747	4.604	7.173	8.610
5	1.476	2.015	2.571	3.365	4.032	5.894	6.869
6	1.440	1.943	2.447	3.143	3.707	5.208	5.959
7	1.415	1.895	2.365	2.998	3.499	4.785	5.408
8	1.397	1.860	2.306	2.896	3.355	4.501	5.041
9	1.383	1.833	2.262	2.821	3.250	4.297	4.781
10	1.372	1.812	2.228	2.764	3.169	4.144	4.587
11	1.363	1.796	2.201	2.718	3.106	4.025	4.437
12	1.356	1.782	2.179	2.681	3.055	3.930	4.318
13	1.350	1.771	2.160	2.650	3.012	3.852	4.221
14	1.345	1.761	2.145	2.624	2.977	3.787	4.140
15	1.341	1.753	2.131	2.602	2.947	3.733	4.073
16	1.337	1.746	2.120	2.583	2.921	3.686	4.015
17	1.333	1.740	2.110	2.567	2.898	3.646	3.965
18	1.330	1.734	2.101	2.552	2.878	3.610	3.922
19	1.328	1.729	2.093	2.539	2.861	3.579	3.883
20	1.325	1.725	2.086	2.528	2.845	3.552	3.850
21	1.323	1.721	2.080	2.518	2.831	3.527	3.819
22	1.321	1.717	2.074	2.508	2.819	3.505	3.792
23	1.319	1.714	2.069	2.500	2.807	3.485	3.768
24	1.318	1.711	2.064	2.492	2.797	3.467	3.745
25	1.316	1.708	2.060	2.485	2.787	3.450	3.725
26	1.315	1.706	2.056	2.479	2.779	3.435	3.707
27	1.314	1.703	2.052	2.473	2.771	3.421	3.689
28	1.313	1.701	2.048	2.467	2.763	3.408	3.674
29	1.311	1.699	2.045	2.462	2.756	3.396	3.660
30	1.310	1.697	2.042	2.457	2.750	3.385	3.646
35	1.306	1.690	2.030	2.438	2.724	3.340	3.591
40	1.303	1.684	2.021	2.423	2.704	3.307	3.551
50	1.299	1.676	2.009	2.403	2.678	3.261	3.496
60	1.296	1.671	2.000	2.390	2.660	3.232	3.460
80	1.292	1.664	1.990	2.374	2.639	3.195	3.416
100	1.290	1.660	1.984	2.364	2.626	3.174	3.390
120	1.289	1.658	1.980	2.358	2.617	3.160	3.373
∞	1.282	1.645	1.960	2.326	2.576	3.090	3.291

Example: $t_{(9,2.5\%)} = 2.262$ means that the probability of a t -value greater than 2.262 is 2.5% for 9 df and the probability of a t -value outside the range -2.262 to $+2.262$ is 5% for 9 df.