UNIVERSITY OF ESWATINI

FIRST SEMESTER, 2019/2020 ACADEMIC YEAR

FINAL EXAMINATION PAPER

PROGRAMME: BSC IN AGRONOMY

COURSE CODE: CPR303

COURSE TITLE: FIELD EXPERIMENTATION

TIME ALLOWED: TWO (2) HOURS

INSTRUCTIONS: ANSWER QUESTION NUMBERS 3, 4, 5 AND ANY ONE OF

QUESTION NUMBERS 1 OR 2

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INVIGILATOR

QUESTION 1   25 marks

1.1. Describe the difference between primary and secondary data (5 marks)

1.2. Describe the sources of primary and secondary data (10 marks)

1.3. Discuss the advantages and disadvantages of primary and secondary data (10 marks)

QUESTION 2   25 marks

2.1. Define experimental design and describe the activities included in experimental design (8 arks)

2.2. Describe the purposes of experimental design (8 marks)

2.3. Explain the factors that affect the choice of experimental design (9 marks)

QUESTION 3   25 marks

3.1. Define replication and describe the functions of replication in an experiment (8 marks)

3.2. Explain the factors determining the number of replications (9 marks)

3.3. Assuming that the minimum error degree of freedom should be 20 for valid test, determine the minimum number of replications in case of Completely Randomised Design (CRD), Randomised Complete Block Design (RCBD) & Latin Square Design, respectively, for number of treatments of 4, 5, 6, 7, and 8 (8 marks)

QUESTION 4   25 marks

4.1. Describe the situations when to use factorial experiments (5 marks)

4.2. Describe the limitations of factorial experiments (5 marks)

4.3. The following two way table shows the effect of seed and nitrogen fertilizer rates on number of effective tillers of wheat per m^2

Nitrogen rate (kg ha^{-1})	Seed rate (kg ha^{-1})	
	80	100
100	250	260
150	280	295

Calculate the simple effects, main effects and interaction effect for this simple factorial experiment (15 marks)

QUESTION 5   25 marks

5.1. Describe the difference between independent and paired t-test and give examples (8 marks)

5.2. Assume that five field assistants were given a diagnostic test before attending training on data collection and then again after completing the training. The following table shows the results obtained out of 50 by the trainees before and after the training.

Trainee	1	2	3	4	5
Mark before training	36	42	32	44	34
Mark after training	44	50	34	48	40

Has the training improved the skill of the field assistants at 5% level of significance? (17 marks)

Percentage Points of the t distribution

Degree of freedom (n-1)	0.25	0.10	0.05	0.025	0.01	0.005	0.0025	0.001	0.0005
1	1.000	3.078	6.314	12.706	31.821	63.657	127.32	318.31	636.62
2	0.816	1.886	2.920	4.303	6.965	9.925	14.089	23.328	31.598
3	0.765	1.638	2.353	3.182	4.541	5.841	7.453	10.213	12.924
4	0.741	1.533	2.132	2.776	3.747	4.604	5.598	7.173	8.610
5	0.727	1.475	2.015	2.571	3.365	4.032	4.773	5.893	6.869
6	0.727	1.440	1.943	2.447	3.143	3.707	4.317	5.208	5.959
7	0.711	1.415	1.895	2.365	2.998	3.499	4.019	4.785	5.408
8	0.706	1.397	1.860	2.306	2.896	3.355	3.833	4.501	5.041
9	0.703	1.383	1.833	2.262	2.821	3.250	3.690	4.297	4.780
10	0.700	1.372	1.812	2.228	2.764	3.169	3.581	4.144	4.587
11	0.697	1.363	1.796	2.201	2.718	3.106	3.497	4.025	4.437
12	0.695	1.356	1.782	2.179	2.681	3.055	3.428	3.930	4.318
13	0.694	1.350	1.771	2.160	2.650	3.012	3.372	3.852	4.221
14	0.692	1.345	1.761	2.145	2.624	2.977	3.326	3.787	4.140
15	0.691	1.341	1.753	2.131	2.620	2.947	3.286	3.733	4.073
16	0.690	1.337	1.746	2.120	2.583	2.921	3.252	3.686	4.015
17	0.689	1.333	1.740	2.110	2.567	2.898	3.222	3.646	3.965
18	0.688	1.330	1.734	2.101	2.552	2.878	3.197	3.610	3.922
19	0.688	1.328	1.729	2.093	2.539	2.861	3.174	3.579	3.883
20	0.687	1.325	1.725	2.086	2.528	2.845	3.153	3.552	3.850
21	0.687	1.323	1.721	2.080	2.518	2.831	3.135	3.527	3.819
22	0.686	1.321	1.717	2.074	2.508	2.819	3.119	3.505	3.792
23	0.685	1.319	1.714	2.069	2.500	2.807	3.104	3.485	3.767
24	0.685	1.318	1.711	2.064	2.492	2.797	3.091	3.467	3.745
25	0.684	1.316	1.708	2.060	2.485	2.787	3.078	3.450	3.725
26	0.684	1.315	1.706	2.056	2.479	2.779	3.067	3.435	3.707
27	0.684	1.314	1.703	2.052	2.473	2.771	3.057	3.421	3.690
28	0.683	1.313	1.701	2.048	2.467	2.763	3.047	3.408	3.674
29	0.683	1.311	1.699	2.045	2.462	2.756	3.038	3.396	3.659
30	0.683	1.310	1.697	2.042	2.457	2.750	3.030	3.385	3.646
40	0.681	1.303	1.684	2.021	2.423	2.704	2.971	3.307	3.551
60	0.679	1.296	1.671	2.000	2.390	2.660	2.915	3.232	3.460
120	0.677	1.289	1.658	1.980	2.358	2.617	2.860	3.160	3.373
∞	0.674	1.282	1.645	1.960	2.326	2.576	2.807	3.090	3.291