UNIVERSITY OF ESWATINI

DEPARTMENT OF GEOGRAPHY, ENVIRONMENTAL SCIENCE AND PLANNING

RE-SIT EXAMINATION PAPER JULY 2019

B.SC., B.A., BASS & B.ED

TITLE OF PAPER: STATISTICAL MEASURES AND ANALYSIS

COURSE NUMBER: GEP 224

TIME ALLOWED: THREE (3) HOURS

INSTRUCTIONS:

1. ANSWER THREE (3) QUESTIONS
2. QUESTION 1 IS COMPULSORY
3. CHOOSE TWO (2) QUESTIONS FROM SECTION B
4. WHERE APPROPRIATE, ILLUSTRATE YOUR ANSWERS WITH EXAMPLES
5. ALL WORKING AND/OR CALCULATIONS MUST BE SHOWN
6. YOU WILL BE PROVIDED WITH GRAPH PAPERS AND TABLES FOR CRITICAL VALUES AND SIGNIFICANT LEVELS.

ALLOCATION OF MARKS: QUESTION ONE (1) CARRIES 40 MARKS WHILE THE REST CARRY 30 MARKS EACH

THIS PAPER SHOULD NOT BE OPENED UNTIL PERMISSION IS GRANTED BY

THE INVIGILATOR

GEP 224: STATISTICAL MEASURES & ANALYSIS

RE-SIT EXAMINATION   JULY 2019

SECTION A: COMPULSORY

QUESTION 1

When used with three different lubricants, a specific group of machine parts show weight losses (in milligrams) due to friction as shown in table 1.

Table 1 Types of Lubricants

Lubricant X:	10	13	12	10	14	8	12	13			
Lubricant Y:	9	8	12	9	8	11	7	6	8	11	9
Lubricant Z:	6	7	7	5	9	8	4	10			

Assuming that these data constitute random samples from three normal populations with the same standard deviation, perform an analysis of variance to decide whether the differences among the three sample means can be attributed to chance. Use the 0.01 level of significance.

(40 Marks)

SECTION B: ANSWER ANY TWO QUESTIONS

QUESTION 2

(a)   Identify the main sources of information generally available to a geographer conducting research.   (10 marks)

(b)   With reference to the situation in developing countries, discuss the availability and quality of the sources identified in (a) above.   (20 marks)

(30 Marks)

QUESTION 3

Table 2 shows the ages of sampled heads of households at Ngwane Park a suburb of Manzini urban area and Mkhulamini a rural area in the Manzini district. The Null (H_0) hypothesis was stated as: There is no difference between the mean ages of the urban and rural settlement household heads. The alternative hypothesis (H_1) states that: There is a difference between the mean ages of the urban and rural settlement household heads. The significant level was set at 0.05.

a)   Calculate the Student's t-test to establish the difference between the two samples.

(25marks)

b) Establish whether you would accept or reject H_0 based on the results in (a)

(5marks)

(30 Marks)

Table 2 Ages of sampled heads of households at Ngwane Park and Mkhulamini

Ngwane Park x	Mkhulamini y
57	38
43	37
38	46
49	43
47	33
53	34
59	41
49	45
38	40
59	32

Source: Hypothetical

QUESTION 4

Identify three main sampling techniques and explain how each one of them is applied.

(30 Marks)

QUESTION 5

a) Identify three (3) geographical problems where participant observation
    would be a suitable technique for data collection.   (18 marks)
b) Discuss the disadvantages of using participant observation in a research.   (12 marks)

(30 marks)

Table entry for p and C is the critical value t^* with probability p lying to its right and probability C lying between $-t^*$ and t^*.
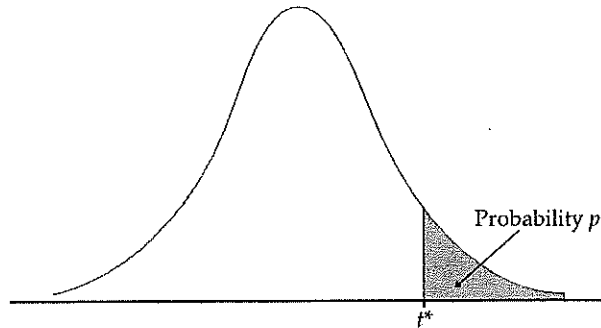

Probability p

TABLE D

t distribution critical values

df	Upper-tail probability p											
	.25	.20	.15	.10	.05	.025	.02	.01	.005	.0025	.001	.0005
1	1.000	1.376	1.963	3.078	6.314	12.71	15.89	31.82	63.66	127.3	318.3	636.6
2	0.816	1.061	1.386	1.886	2.920	4.303	4.849	6.965	9.925	14.09	22.33	31.60
3	0.765	0.978	1.250	1.638	2.353	3.182	3.482	4.541	5.841	7.453	10.21	12.92
4	0.741	0.941	1.190	1.533	2.132	2.776	2.999	3.747	4.604	5.598	7.173	8.610
5	0.727	0.920	1.156	1.476	2.015	2.571	2.757	3.365	4.032	4.773	5.893	6.869
6	0.718	0.906	1.134	1.440	1.943	2.447	2.612	3.143	3.707	4.317	5.208	5.959
7	0.711	0.896	1.119	1.415	1.895	2.365	2.517	2.998	3.499	4.029	4.785	5.408
8	0.706	0.889	1.108	1.397	1.860	2.306	2.449	2.896	3.355	3.833	4.501	5.041
9	0.703	0.883	1.100	1.383	1.833	2.262	2.398	2.821	3.250	3.690	4.297	4.781
10	0.700	0.879	1.093	1.372	1.812	2.228	2.359	2.764	3.169	3.581	4.144	4.587
11	0.697	0.876	1.088	1.363	1.796	2.201	2.328	2.718	3.106	3.497	4.025	4.437
12	0.695	0.873	1.083	1.356	1.782	2.179	2.303	2.681	3.055	3.428	3.930	4.318
13	0.694	0.870	1.079	1.350	1.771	2.160	2.282	2.650	3.012	3.372	3.852	4.221
14	0.692	0.868	1.076	1.345	1.761	2.145	2.264	2.624	2.977	3.326	3.787	4.140
15	0.691	0.866	1.074	1.341	1.753	2.131	2.249	2.602	2.947	3.286	3.733	4.073
16	0.690	0.865	1.071	1.337	1.746	2.120	2.235	2.583	2.921	3.252	3.686	4.015
17	0.689	0.863	1.069	1.333	1.740	2.110	2.224	2.567	2.898	3.222	3.646	3.965
18	0.688	0.862	1.067	1.330	1.734	2.101	2.214	2.552	2.878	3.197	3.611	3.922
19	0.688	0.861	1.066	1.328	1.729	2.093	2.205	2.539	2.861	3.174	3.579	3.883
20	0.687	0.860	1.064	1.325	1.725	2.086	2.197	2.528	2.845	3.153	3.552	3.850
21	0.686	0.859	1.063	1.323	1.721	2.080	2.189	2.518	2.831	3.135	3.527	3.819
22	0.686	0.858	1.061	1.321	1.717	2.074	2.183	2.508	2.819	3.119	3.505	3.792
23	0.685	0.858	1.060	1.319	1.714	2.069	2.177	2.500	2.807	3.104	3.485	3.768
24	0.685	0.857	1.059	1.318	1.711	2.064	2.172	2.492	2.797	3.091	3.467	3.745
25	0.684	0.856	1.058	1.316	1.708	2.060	2.167	2.485	2.787	3.078	3.450	3.725
26	0.684	0.856	1.058	1.315	1.706	2.056	2.162	2.479	2.779	3.067	3.435	3.707
27	0.684	0.855	1.057	1.314	1.703	2.052	2.158	2.473	2.771	3.057	3.421	3.690
28	0.683	0.855	1.056	1.313	1.701	2.048	2.154	2.467	2.763	3.047	3.408	3.674
29	0.683	0.854	1.055	1.311	1.699	2.045	2.150	2.462	2.756	3.038	3.396	3.659
30	0.683	0.854	1.055	1.310	1.697	2.042	2.147	2.457	2.750	3.030	3.385	3.646
40	0.681	0.851	1.050	1.303	1.684	2.021	2.123	2.423	2.704	2.971	3.307	3.551
50	0.679	0.849	1.047	1.299	1.676	2.009	2.109	2.403	2.678	2.937	3.261	3.496
60	0.679	0.848	1.045	1.296	1.671	2.000	2.099	2.390	2.660	2.915	3.232	3.460
80	0.678	0.846	1.043	1.292	1.664	1.990	2.088	2.374	2.639	2.887	3.195	3.416
100	0.677	0.845	1.042	1.290	1.660	1.984	2.081	2.364	2.626	2.871	3.174	3.390
1000	0.675	0.842	1.037	1.282	1.646	1.962	2.056	2.330	2.581	2.813	3.098	3.300
z^*	0.674	0.841	1.036	1.282	1.645	1.960	2.054	2.326	2.576	2.807	3.091	3.291
	50%	60%	70%	80%	90%	95%	96%	98%	99%	99.5%	99.8%	99.9%
	Confidence level C											