

**UNIVERSITY OF SWAZILAND  
FINAL EXAMINATION PAPER MAY 2007  
B.SC., B.A., B.A.S.S AND B.ED.**

TITLE : STATISTICAL GEOGRAPHY

COURSE NUMBER : GEP 223

TIME ALLOWED : THREE (3) HOURS

INSTRUCTIONS :

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

MARK ALLOCATION : QUESTION ONE (1) CARRIES FORTY (40) MARKS AND THE OTHER QUESTIONS ARE THIRTY (30) MARKS EACH.

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## **SECTION A : COMPULSORY SECTION**

### **QUESTION 1**

Using data provided on Table 1 showing the production of major crops in Swaziland.

- (a) Plot a line graph showing the production of sugar cane in Swaziland between 1966 and 2000. (10 marks)
- (b) Calculate the 5-year running means for maize production. (20 marks)
- (c) Using the same graph plotted for (a) above, plot another line graph showing the 5-year running means obtained in (b) above. (10 marks)

**(40 marks)**

## **SECTION B : ANSWER ANY TWO (2) QUESTIONS**

### **QUESTION 2**

Identify three (3) geographical research problems where participant observation will be a suitable technique for collecting data. (30 marks)

### **QUESTION 3**

The Ministry of Education has commissioned surveyors to undertake a survey that is aimed at determining the relationship between age and weight of students in high schools in Swaziland. Due to financial constraints, the Ministry is unable to cover all the schools in the whole country, thus chose only ten (10) schools in the Hhohho district.

- (a) Justify why this is not a representative sample of high schools in the country. (10 marks)
- (b) With data provided on table 2, which shows the age and weight of students from Nkhamba High School one of the selected schools in the Hhohho district, calculate the Pearson Product Moment Correlation and the Spearman Rank Correlation Coefficients. (20 marks)

(20 marks)

**(30 marks)**

### **QUESTION 4**

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

**(30 marks)**

### QUESTION 5

Table 3 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 hypothesis ( $H_0$ ) was stated as: There is no difference between the mean ages of the urban and rural settlement. The Alternative hypothesis ( $H_1$ ) was stated as: There is a difference between the mean ages of the urban and rural settlement. The significant level was set at 0.05. Do the following:

- (a) Calculate the Student's t-test to establish the difference between the two samples.  
(20 marks)
- (b) Establish whether you would accept or reject the  $H_0$  based on the results obtained in (a).  
(10 marks)
- (30 marks)**

**Table 1 Production of sugar cane and maize in Swaziland ('000 tonnes)**

<b>Year</b>	<b>Sugar cane</b>	<b>Maize</b>
1966	13083	1545
1967	13985	1648
1968	14569	1589
1969	15056	1739
1970	16508	1889
1971	18563	1998
1972	18985	2189
1973	19568	2369
1974	19990	2457
1975	21785	2656
1976	22378	2789
1977	23955	2867
1978	24179	2900
1979	25184	3038
1980	25990	3268
1981	26708	3386
1982	27655	3567
1983	28585	3767
1984	29788	3869
1985	31566	3998
1986	33794	4178
1987	35999	4236
1988	37967	4436
1989	38599	4688
1990	39990	4867
1991	41357	4989
1992	42989	5178
1993	44896	5356
1994	46783	5589
1995	56989	5678

Source: Hypothetical

**Table 2 Age and weight of students from Nkhamba High School**

<b>Student No.</b>	<b>Age</b>	<b>Weight</b>
1	18	64
2	17	60
3	20	68
4	17	61
5	19	66
6	16	63
7	14	58
8	19	65
9	13	54
10	15	60

Source: Hypothetical

**Table 3 Ages of sampled heads of households at Ngwane Park and Mkhulamini**

<b>Ngwane Park</b>	<b>Age (x)</b>	<b>Mkhulamini</b>	<b>Age (y)</b>
	57		38
	43		37
	38		46
	49		43
	47		33
	53		34
	59		41
	49		45
	38		40
	59		32

Source: Hypothetical

**C4 Critical Values of Student's t**

Degrees of freedom	Significance level (one-tailed)				
	0.05	0.025	0.01	0.005	0.0005
	Significance level (two-tailed)				
	0.1	0.05	0.02	0.01	0.001
1	6.31	12.71	31.82	63.66	636.62
2	2.92	4.30	6.97	9.93	31.60
3	2.35	3.18	4.54	5.84	12.92
4	2.13	2.78	3.75	4.60	8.61
5	2.01	2.57	3.37	4.03	6.86
6	1.94	2.45	3.14	3.71	5.96
7	1.89	2.37	3.00	3.50	5.41
8	1.86	2.31	2.90	3.35	5.04
9	1.83	2.26	2.82	3.25	4.78
10	1.81	2.23	2.76	3.17	4.59
11	1.80	2.20	2.72	3.11	4.44
12	1.78	2.18	2.68	3.05	4.32
13	1.77	2.16	2.65	3.01	4.22
14	1.76	2.15	2.62	2.98	4.14
15	1.75	2.13	2.60	2.95	4.07
16	1.75	2.12	2.58	2.92	4.01
17	1.74	2.11	2.57	2.90	3.97
18	1.73	2.10	2.55	2.88	3.92
19	1.73	2.09	2.54	2.86	3.88
20	1.73	2.09	2.53	2.85	3.85
21	1.72	2.08	2.52	2.83	3.82
22	1.72	2.07	2.51	2.82	3.79
23	1.71	2.07	2.50	2.81	3.77
24	1.71	2.06	2.49	2.80	3.75
25	1.71	2.06	2.49	2.79	3.73
26	1.71	2.06	2.48	2.78	3.71
27	1.70	2.05	2.47	2.77	3.69
28	1.70	2.05	2.47	2.76	3.67
29	1.70	2.05	2.46	2.76	3.66
30	1.70	2.04	2.46	2.75	3.65
40	1.68	2.02	2.42	2.70	3.55
60	1.67	2.00	2.39	2.66	3.46
120	1.66	1.98	2.36	2.62	3.37
∞	1.65	1.96	2.33	2.58	3.29

Reject  $H_0$  if calculated value of t is **greater than** critical value at chosen significance level.