UNIVERSITY OF SWAZILAND

FACULTY OF EDUCATION

UNIVERSITY OF SWAZILAND

DEPARTMENT OF EDUCATIONAL FOUNDATIONS AND MANAGEMENT

FOR

FACULTY OF EDUCATION AND THE INSTITUTE OF DISTANCE EDUCATION
FULL TIME AND PART TIME PROGRAMMES

MAY, 2017 FINAL EXAMINATION PAPER

BACHELOR OF EDUCATION 111 (B.Ed.) Full-Time
BACHELOR OF EDUCATION 111 (B.Ed.) Part-Time
POSTGRADUATE CERTIFICATE IN EDUCATION (PGCE) Part-Time

COURSE CODE	:	EDF 322
TITLE OF PAPER	:	EDUCATIONAL RESEARCH
TIME ALLOWED	:	THREE HOURS
INSTRUCTIONS	:	1. THIS PAPER IS DIVIDED INTO **TWO SECTIONS** (**A** AND **B**). ANSWER **ANY TWO** QUESTIONS FROM EACH SECTION **2.** UTILISE THE ATTACHED STATISTICAL FORMULAS AND TABLES WHERE NECESSARY.
TOTAL MARKS	:	100

THIS PAPER IS NOT TO BE OPENED UNTIL PERMISSION TO DO SO HAS BEEN GRANTED BY THE INVIGILATOR.

SECTION A

1. Assess the value and significance of literature review in Educational research.

Total: 25 Marks.

2. Discuss the advantages of using the interview as a data collection tool in Educational research. ***Total: 25 Marks.***

3. Citing at least five examples of your choice, discuss the assertion that, 'the qualitative research paradigm is more applicable to educational research than the quantitative paradigm. ***Total: 25 Marks.***

SECTION B

4. A researcher wanted to establish if there was any significant difference in performance in Mathematics between two groups of students one was taught using English and the other in SiSwati. After a while, a test was administered and the following scores were recorded.

Table 1 Showing the marks of students taught in English and the other in SiSwati

PUPIL	MEDIUM OF INSTRUCTION	
	ENGLISH	SISWATI
A	69	72
B	58	65
C	70	80
D	32	56
E	40	40
F	57	70
G	65	70
H	30	54
I	70	75
J	62	70

i) What is the median of the pupils' scores who wrote the test using English?

(3 marks)

ii) Calculate the variance of pupils' scores whose medium of instruction is English

(10 marks)

iii) Deduce the standard deviation from the calculated variance. **(5 marks)**

iv) Given that the standard deviation for pupils taught in SiSwati is 11.9 in which medium of instruction did student E perform better? **(7 marks)**

[Total: 25 Marks]

5. Ten students wrote two tests and obtained the following scores;

Table 2: Showing student marks

Pupil	A	B	C	D	E	F	G	H	I	J
Test (i)	25	38	35	30	20	30	40	25	35	25
Test(ii)	30	46	50	48	26	36	40	31	40	32

i) Compute Spearman's Rank order coefficient and comment on it. **(20 marks)**

ii) Calculate the mean of test (i) **(4 marks)**

iii) What is the mode of test (i)? **(1 mark)**

[Total 25 Marks]

6. An educationist wanted to establish if the choice of a programme at a certain university was independent of gender. She collected data from three faculties and tabulated it as follows;

Table 3: Showing choice of programmes by gender

GENDER	**PROGRAMME**		
	BA	BSc	B com
Females	210	180	70
Males	150	200	190

Carry out a chi-squared test at 5% significance level to determine if the choice of a programme is independent of gender. Follow the steps suggested below.

i) State the null and alternative hypothesis **(2 marks)**

ii) Calculate the degrees of freedom **(1 mark)**

iii) State the rejection criterion **(1 mark)**

iv) Calculate the expected frequencies **(12 marks)**

v) Calculate the value of test statistic **(4 marks)**

vi) Make a conclusion **(5 marks)**

[Total 25 Marks]

TABLE IV Critical Values of Chi Square

	Level of significance for a non-directional test					
df	.20	.10	.05	.02	.01	.001
1	1.64	2.71	3.84	5.41	6.64	10.83
2	3.22	4.60	5.99	7.82	9.21	13.82
3	4.64	6.25	7.82	9.84	11.34	16.27
4	5.99	7.78	9.49	11.67	13.28	18.46
5	7.29	9.24	11.07	13.39	15.09	20.52
6	8.56	10.64	12.59	15.03	16.81	22.46
7	9.80	12.02	14.07	16.62	18.48	24.32
8	11.03	13.36	15.51	18.17	20.09	26.12
9	12.24	14.68	16.92	19.68	21.67	27.88
10	13.44	15.99	18.31	21.16	23.21	29.59
11	14.63	17.28	19.68	22.62	24.72	31.26
12	15.81	18.55	21.03	24.05	26.22	32.91
13	16.98	19.81	22.36	25.47	27.69	34.53
14	18.15	21.06	23.68	26.87	29.14	36.12
15	19.31	22.31	25.00	28.26	30.58	37.70
16	20.46	23.54	26.30	29.63	32.00	39.29
17	21.62	24.77	27.59	31.00	33.41	40.75
18	22.76	25.99	28.87	32.35	34.80	42.31
19	23.90	27.20	30.14	33.69	36.19	43.82
20	25.04	28.41	31.41	35.02	37.57	45.32
21	26.17	29.62	32.67	36.34	38.93	46.80
22	27.30	30.81	33.92	37.66	40.29	48.27
23	28.43	32.01	35.17	38.97	41.64	49.73
24	29.55	33.20	36.42	40.27	42.98	51.18
25	30.68	34.38	37.65	41.57	44.31	52.62
26	31.80	35.56	38.88	42.86	45.64	54.05
27	32.91	36.74	40.11	44.14	46.96	55.48
28	34.03	37.92	41.34	45.42	48.28	56.89
29	35.14	39.09	42.69	46.69	49.59	58.30
30	36.25	40.26	43.77	47.96	50.89	59.70
32	38.47	42.59	46.19	50.49	53.49	62.49
34	40.68	44.90	48.60	53.00	56.06	65.25
36	42.88	47.21	51.00	55.49	58.62	67.99
38	45.08	49.51	53.38	57.97	61.16	70.70
40	47.27	51.81	55.76	60.44	63.69	73.40
44	51.64	56.37	60.48	65.34	68.71	78.75
48	55.99	60.91	65.17	70.20	73.68	84.04
52	60.33	65.42	69.83	75.02	78.62	89.27
56	64.66	69.92	74.47	79.82	83.51	94.46
60	68.97	74.40	79.08	84.58	88.38	99.61

Find the row corresponding to the indicated degrees of freedom, find the column corresponding to the chosen level of significance, the critical value of χ^2_{crit} is at the intersection of that row and that column. If $\chi^2_{obs} \geq \chi^2_{crit}$ then H_0 is rejected.

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STATISTICAL FORMULAE

Sample Variance: $S^2 = \frac{\sum(x-\bar{x})^2}{n-1}$

Sample Standard Deviation: $s = \sqrt{\frac{\sum(x-\bar{x})^2}{n-1}}$

Product moment correlation coefficient:

$$r_{xy} = \frac{n\sum xy - \sum x \sum y}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}$$

Spearman's rank order correlation coefficient: $rho = 1 - \frac{6\sum d^2}{n(n^2-1)}$

Chi-squared Test Statistic: $x^2 = \sum \frac{(0-E)^2}{E}$

Z-score: $z = \frac{x-\bar{x}}{s}$

Standardisation: $z = \frac{u-\mu}{\sigma}$ **Where Z ~N(0,1)**

T-score: $T = 50 + 10\left(\frac{x-\bar{x}}{s}\right)$

Student t-test: $t = \frac{\sqrt{(n-1)}\sum d}{\sqrt{n\sum d^2 - (\sum d)^2}}$

ANALYSIS OF VARIANCE (ANOVA) FORMULAE

1. $SS\,(\text{TOTAL}) = \sum x^2 - \frac{(\sum x)^2}{n}$

2. $SST = SS(\text{Treatment}) = SS(BtwnGrps) = \sum \frac{T_i^2}{n_i} - \frac{(\sum x)^2}{n} = \frac{T_1^2}{n_1} + \frac{r_2^2}{n_2} + \cdots + \frac{T_p^2}{n_p} - \frac{(\sum x)^2}{n}$

3. $SSE = SS\,(TOTAL) - SST$

   [N.B. $SSE = SS$ (Error) $= SS$ (Within Groups) $= SS$ (Residual)]

4. $MST = \frac{SST}{p-1}$

5. $MSE = \frac{SSE}{n-p}$

6. $F_{calc} = \frac{MST}{MSE}$

ONE-WAY ANOVA TABLE

Source of variation	**Sum of squares**	**Degrees of Freedom (df)**	**Mean Square**	F_{calc}
Between Groups (Treatments)	SST	$p-1$	$MST = \frac{SST}{p-1}$	$F_{calc} = \frac{MST}{MSE}$
Within Groups (Error or Residual)	SSE	$n-p$	$MSE = \frac{SSE}{n-p}$	
Total	$SS(TOTAL)$	$n-1$		

n = total number of observations

p = number of treatments (number of samples or groups)

p-1 = numerator degrees of freedom

n-p = denominator degrees of freedom

T_i= total for group i(i = 1, 2, 3, …, p)

n_i= number of observations in group i(i = 1, 2, 3, …, p)