UNIVERSITY OF ESWATINI

FACULTY OF EDUCATION

DEPARTMENT OF EDUCATIONAL FOUNDATIONS AND MANAGEMENT

FOR

FACULTY OF EDUCATION AND
INSTITUTE OF DISTANCE EDUCATION

POSTGRADUATE CERTIFICATE IN EDUCATION (PGCE) **Full/Part Time**

NOVEMBER, 2018 FINAL EXAMINATION PAPER

COURSE CODE	:	EFM 515
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 PROVIDED WHERE NECESSARY.
TOTAL MARKS	:	100

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

Question 1

(a) Describe the meaning of educational research showing how it is different from journalism? **(5 marks)**

(b) Using practical examples, discuss any four different purposes of educational research. **(20 marks)**

[Total 25 marks]

Question 2

(a) Examine the significance of the literature review in enhancing the quality of a research study. **(15 marks)**

(b) Describe the features of each of the four sub-sections in organizing and developing a proper literature reviewwith a beginning, the middle and an end. **(10 marks)**

[Total 25 marks]

Question 3

Discuss any five differences between a survey and a case study research design.

[Total 25 marks]

Question 4

Below are pairs of marks for SiSwati (x) and Geography scores (y).

Table 1: siSwati and Geography scores

Student	A	B	C	D	E	F	G	H	I	J
siSwati (x)	50	80	55	75	60	70	65	65	58	72
Geography(y)	60	80	45	85	50	65	55	60	50	70

a) Using the scores above, calculate the Spearmen's rank order correlation coefficient. **(20 marks)**

b) State the range for Geography. **(1 mark)**

c) State one advantage and one disadvantage of the range. **(4 marks)**

Question5

a) Using information in **Table 1** above, draw a scatter gram. **(10 marks)**

b) From the information in**Table 1**, calculate the Standard deviation for Geography.

c) State the median for siSwati. **(3 marks)**

d)Give any **two** disadvantages of the median. **(2 marks)**

Question6

A psychologist claims that students who perform well in English do not necessarily perform well in Mathematics. She collected the following scores for 10 students as represented in **Table 2 below**.

Table 2: Maths and English scores

Student	A	B	C	D	E	F	G	H	I	J
English	44	70	70	78	80	45	70	56	80	78
Maths	36	64	86	72	84	35	84	64	70	62

a) Using information in **Table 2** above calculatethe Pearson's product moment correlation coefficient and comment on it. **(25 marks)**

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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)

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

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

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

   [N.B. $SSE = SS\ (\text{Error}) = SS\ (\text{Within Groups}) = SS\ (\text{Residual})$]

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	$SS(\text{TOTAL})$	$n-1$		

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)