JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF EDUCATION
UNIVERSITY EXAMINATION FOR DEGREE OF MASTER OF EDUCATION
(EDUCATIONAL ADMINISTRATION)
1ST YEAR 1ST SEMESTER 2016/2017 ACADEMIC YEAR
SCHOOL BASED (MAIN CAMPUS)

COURSE CODE: EMA 858

COURSE TITLE: COMPUTER APPLICATION IN RESEARCH

EXAM VENUE: **STREAM: M.ED**

DATE: **EXAM SESSION: DECEMBER 2016**

TIME: 3.00 HOURS

Instructions:

1. Answer ANY 3 questions
2. Candidates are advised not to write on the question paper.
3. Candidates must hand in their answer booklets to the invigilator while in the examination room.

1. a. What do you understand by the following as used in SPSS

   i.   Codebook?   (2 marks)
   ii.   Viewer window   (2 marks)
   iii. Data editor window   (2 marks)

   b. A researcher investigated the relationship between four teaching strategies and performance in biology among Form Four students in four schools. The students were obtained from the same school and were randomly assigned to four groups. The students were taught by the same teacher but using a different strategy for each group. After covering the content, the students in the four groups sat a test which was scored out of 100 marks.
   i. With a reason, state the test statistic which can be used to analyse the data.
   - Statistic   (1 mark)
   - Reasons   (4 marks)
   i.   Describe the procedure for conducting the test stated in (b)(i) above (9 marks)

2. (a) A researcher wanted to find out whether there is a significant difference between the total optimism score on the optimism scale across three age groups. On analyzing the data by conducting an ANOVA test using SPSS, the researcher obtained the output shown in the tables below. Use the output tables to answer the questions that follow.

   Output from a one-way between groups ANOVA

   Oneway

   Descriptives
   Total Optimism

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	95% Confidence Interval for Mean Upper Bound	Minimum	Maximum
1 18-29	147	21.36	4.551	375	20.62	22.10	7	30
2 30-44	153	22.10	4.147	335	21.44	22.77	10	30
3 45+	135	22.96	4.485	386	22.19	23.72	8	30
Total	435	22.12	4.429	212	21.70	22.53	7	30

   Test of Homogeneity of variance
   Total Optimism

Levene Statistic	df1	df2	Sig.
746	2	432	.475

   ANOVA
   Total Optimism

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	179.089	2	89.535	4.641	.010
Within Groups	833.951	432	19.292		
Total	8513.021	434			

Robust Tests Of Equality Of Means
Total Optimism

	Statistic	df1	df2	Sig.
Welch	4.380	2	284.508	.013
Brown-Forsythe	4.623	2	423.601	.010

Multiple Comparisons
Dependent Variable: Total Optimism
Tukey HSD

(I)Age.3 groups	(J)age 3 groups	Mean Difference (I-J)	Std. Error	Sig	95% Confidence Interval	
					Lower Bound	Upper Bound
1 18-29	2 30-44	-.744	.507	.308	-1.94	.45
	3 45+	-1.595*	.524	.007	-2.83	-.36
2 30-44	1 18-29	-.744	.507	.308	-.45	1.94
	3 45+	-.851	.519	.230	-2.07	.37
3 45+	1 18-29	1.595*	.524	.007	.36	2.83
	2 30-44	.851	.519	.230	-.37	2.07

* The mean difference is significant at the 0.05 level

(a) What was the total number of individuals that were studied? (1 mk)
(b) Describe the role of the tables titled
i. **Test of Homogeneity of variance** (2 marks)
ii. *Descriptives* (2 marks)
iii. *ANOVA* (2 marks)
iv. *Multiple comparisons* (2 marks)
(iii) With a reason, state whether there is a significant difference between the groups. (3 mks)
c. i. Give two examples of effect size tests (2 marks)
   ii. What is the importance of calculating effect size in statistical tests. (2 marks)

(c) Describe the procedure the researcher could have used to assess whether the variables in this study were normally distributed or not. (4 marks)

3. A researcher collected data from four schools in two sub-counties concerning the perception of the students about some aspects of their teachers. The schools were St Peters, St Sisilia, St Cecil and St Metrine and the sub-counties were Kisumu and Siaya. The questionnaire for data collection is shown below:-

Students' questionnaire

1. **Gender** ....
2. **Age** ....
3. **Indicate your level of agreement with the statements after the key below**

                    KEY
        1   =   **Strongly disagree**
        2   =   **Disagree**
        3   =   **Undecided**
        4   =   **Agree**

3

5   =   **Strongly Agree**

      (a)   **Our teachers are well educated**   **1**   **2**   **3**   **4**   **5**
      (b)   **Our teachers are always prepared for lessons1**   **2**   **3**   **4**   **5**
      (c)   **Our teachers are well groomed**   **1**   **2**   **3**   **4**   **5**
      (d)   **Our teachers are disciplined**   **1**   **2**   **3**   **4**   **5**
      (e)   **Our teachers love their work**   **1**   **2**   **3**   **4**   **5**

Use the above questionnaire to answer the questions that follow:-
    (i) From the questionnaire which data items will give you:-
          ○   Nominal data   (2 mks)
          ○   Interval data   (2 mks)
          ○   Ordinal data   (2 mks)
    (ii) Outline the rules for naming variables.   (5 mks)
    (iii) Prepare a code book for the data collected.   (9 mks)

4. (a) What are the conditions for conducting independent samples t-test?   (4 mks)
     b. A researcher conducted a research to explore sex differences in self-esteem scores and obtained the output as shown in the tables below. Use the output tables to answer the questions that follow:-

The output generated from this procedure is shown below

Group Statistics

| SEX		N	Mean	Std. Deviation	Std. Error Mean
Total self	MALES	484	34.02	4.91	36
esteem	FEMALES	352	33.17	5.71	36

Independent samples t-test

		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Total self esteem	Equal variances assumed	3.505	.062	1.622	434	.105	85	52	18	1.87
	Equal variances not assumed			1.661	422.349	.098	85	51	18	1.85

    (a) How many males and females participated in the study?
       (i) Males   (1 mk)
       (ii) Females   (1 mk)
    (b) What was the P value for the t-test?   (2 mks)
    (c) State whether there was a significant difference between the means for males and females and why you think so?   (3 mks)
    (d) Describe the role of the information in the output table titled *Independent samples t-test*   (9 marks)

5. (a) Distinguish between

(i)   Data view and variable view in the data editor window of SPSS.   (2 mks)
(ii)   Warm booting and cold booting of a computer   (2 mks)
b. What is the importance of graphs in statistical tests (2 marks)
c. Below is an example of a box plot graph. Use it to answer the questions that follow.
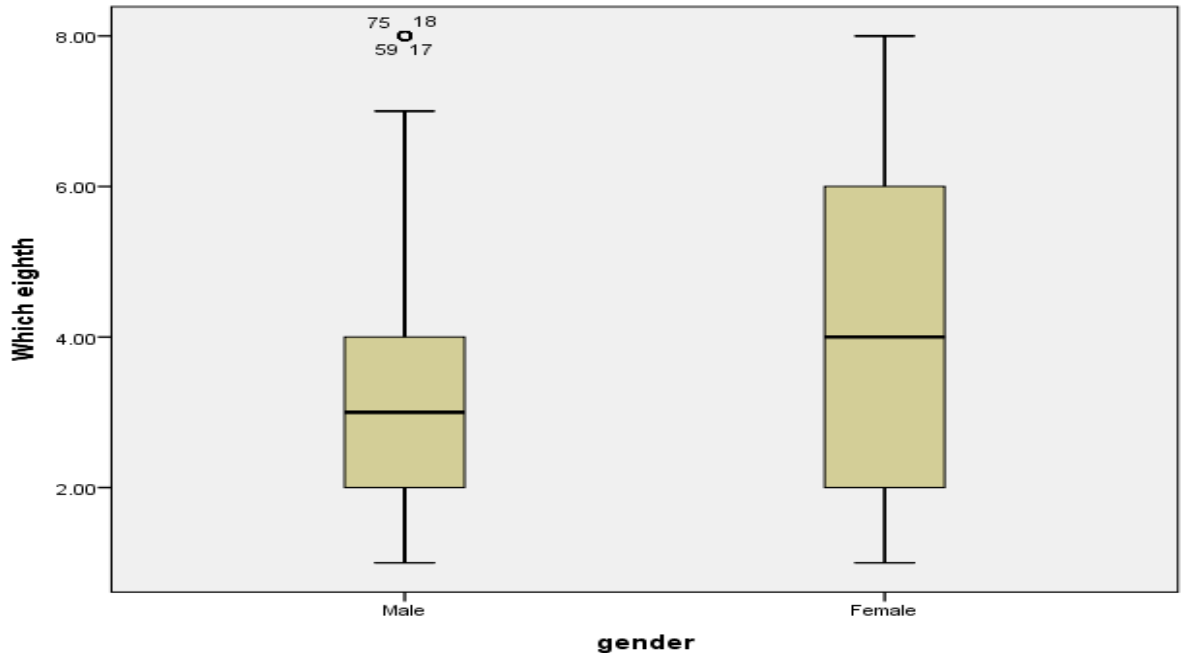
i.   How does the box plot help a researcher (3 marks)
ii.   What is the significance of the
        • length of the box?   (2 marks)
        • the lines across the inside of the box (2 marks)
        • the numbers that appear around the little circle in the first box plot (2 marks)

d. Describe the process of creating a data file and entering data?   (5 mks)