# MAASAI MARA UNIVERSITY

## REGULAR UNIVERSITY EXAMINATIONS

## 2018/2019 ACADEMIC YEAR

### FIRST YEAR SECOND SEMESTER

## SCHOOL OF EDUCATION
## MASTER OF EDUCATION (SPECIAL NEEDS EDUCATION)

**COURSE CODE: PSY 8102C**
**COURSE TITLE: EDUCATIONAL STATISTICS**

DATE: 18/4/2019                    TIME: 14:30 – 17:30 PM

**INSTRUCTIONS TO CANDIDATES**
**Answer Question ONE and any other TWO questions**

**QUESTION ONE (COMPULSURY) 15 MARKS**
    a)     Differentiate between the following terms;
          i)     Null and alternative hypotheses
          ii)    One tailed and two tailed tests
          iii)   Type one (I) and type two (II) errors
          iv)   Positive and negative correlations
          **v)**    Point and interval estimators      **(5 marks)**

    b)     Identify steps followed in statistical hypothesis testing    **(5    marks)**

    c)     Given the following data of scores derived from an English test,

| CLASS INTERVAL | FREQUENCY |
|---|---|
| 33-35 | 2 |
| 30-32 | 4 |
| 27-29 | 4 |
| 24-26 | 8 |
| 21-23 | 8 |
| 18-20 | 5 |
| 15-17 | 2 |
| 12-14 | 1 |

    a) Compute mode, median, mean, variance and standard deviation for the above data
                **(5 marks)**

**QUESTION TWO (15 MARKS)**
  a)  State the level (or scale) of measurement in the following
    (i)     Students' scores in a physics test
    (ii)    Classification of Maasai Mara University students on graduation day
    (iii)   Number of hours high school students' study per week
    (iv)   Ranking of school management by principals designated as excellent, best, satisfactory and worse
    **(v)**    Marks given by two supervisors to a postgraduate student    **(5 marks)**
Given below is a set of 80 scores obtained on a form 3 Chemistry test.

| 73 | 50 | 77 | 81 | 58 | 62 | 68 | 84 | 55 | 46 |
|---|---|---|---|---|---|---|---|---|---|
| 47 | 94 | 69 | 68 | 47 | 51 | 78 | 62 | 55 | 53 |
| 79 | 81 | 86 | 78 | 88 | 55 | 69 | 53 | 58 | 87 |
| 82 | 65 | 68 | 71 | 50 | 76 | 74 | 53 | 56 | 71 |
| 77 | 50 | 65 | 79 | 70 | 40 | 69 | 97 | 45 | 68 |

| 59 | 85 | 80 | 74 | 42 | 61 | 73 | 57 | 64 | 50 |
|----|----|----|----|----|----|----|----|----|----|
| 62 | 79 | 75 | 91 | 68 | 50 | 64 | 44 | 64 | 76 |
| 91 | 69 | 59 | 68 | 50 | 68 | 66 | 55 | 50 | 70 |

**(a)** Prepare a complete grouped frequency distribution table for the above data, which should have seven columns (class, tally marks, frequency, and midpoints, less than cumulative frequency and more than cumulative frequency. Take a class –interval of size 5, width 40 – 44 as the lowest class-interval. **(10 marks)**

## QUESTION THREE (15 MARKS)

(a) With examples, explain the meaning of the following statistical concepts;
  i)   Standardization
  ii)  Normalization
  iii) Standard score
  iv)  Percentile rank
  **v)** Z-score **(5 marks)**
(b) Given a mean of 40 and a standard deviation of 16, complete the following table:

| X | Z | T-score | Stanine |
|---|---|---------|---------|
| 10 | | | |
| 26 | | | |
| 38 | | | |
| 42 | | | |
| 44 | | | |

**(10 marks)**

## QUESTION FOUR (15 MARKS)

Given below are scores obtained by twelve (12) forms 2 students on two tests in Mathematics and Physics.

| Student | A | B | C | D | E | F | G | H | I | J | K | L |
|---------|---|---|---|---|---|---|---|---|---|---|---|---|
| Mathematics | 72 | 70 | 69 | 66 | 63 | 60 | 60 | 59 | 57 | 55 | 52 | 49 |
| Physics | 40 | 35 | 33 | 27 | 29 | 31 | 30 | 26 | 28 | 34 | 25 | 22 |

(a) (i) Calculate the Pearson product – moment correlation coefficient ($r_{xy}$) for the above

    data. **(8 marks)**
   (ii) Interpret the obtained value ($r_{xy}$) **(2 marks)**
(c) Give TWO assumptions of Pearson product –moment correlation coefficient, $r_{xy}$.
**(2 marks)**
(d) Interpret the results and make the decision to whether to accept or reject the null hypothesis at 0.05 level of significance **(3 marks)**

## QUESTION FIVE (15 MARKS)

The following table shows the "A" level psychology results of students from two colleges distributed in the A, B and C grades.

| Grades | A | B | C | Row totals |
|---|---|---|---|---|
| College X | 7 | 41 | 15 | 63 |
| College Y | 8 | 42 | 46 | 96 |
| Column totals | 15 | 83 | 61 | 159     Grand Total |

a) State the null hypothesis for this data                                    **(2 mark)**

b) Work out the Chi Square ($\chi^2$ ) for the above data to test the null hypothesis           **(10 marks)**

c) Interpret the results and make the decision to whether to accept or reject the null hypothesis at 0.05 level of significance
**(3 marks)**

## QUESTION SEVEN (15 MARKS)

A researcher is interested to find out whether time spent studying in the library improves performance in the end semester examination among ten (10) first year university students. The table below shows the data obtained;

| SUBJECT | STUDY TIME (Average hours per semester) | EXAMINATION SCORES (out of 100%) |
|---|---|---|
| A | 40 | 58 |
| B | 43 | 73 |
| C | 18 | 56 |
| D | 10 | 47 |
| E | 25 | 58 |
| F | 33 | 54 |
| G | 27 | 45 |
| H | 17 | 32 |
| I | 30 | 68 |
| J | 47 | 69 |

(a) (i) Calculate the Spearman rank order correlation coefficient (rho) for the above

data.                                                                           **(8 marks)**

(ii) Interpret the obtained value (rxy)                                     **(2 marks)**

(b) Give TWO assumptions of Spearman rank order correlation coefficient (rho)
**(2 marks)**

(c) Interpret the results and make the decision to whether to accept or reject the null hypothesis at 0.05 level of significance                                     **(3 marks)**

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