



# MACHAKOS UNIVERSITY

University Examinations 2020/2021 Academic Year

SCHOOL OF EDUCATION

DEPARTMENT OF EDUCATIONAL MANAGEMENT AND CURRICULUM STUDIES

FIRST YEAR FIRST SEMESTER EXAMINATION FOR

MASTER OF EDUCATION (EDUCATIONAL ADMINISTRATION)

ECC 802: EDUCATIONAL STATISTICS

DATE: 15/8/2021

TIME: 8.30-11.30 AM

---

## INSTRUCTIONS

*Answer Question one and any other two questions.*

### QUESTION ONE (20 MARKS)

- a) Complete the table below. (4 marks)

CLASS INTERVAL	MID-POINT X	FREQUENCY f	Frequency x mid-point f x X
0-10	5	5	
10-20	15	10	
20-30	25	16	
30-40	35	22	
40-50	45	16	
50-60	55	12	
60-70	65	4	
Totals		N= 85	

- b) Calculate the mean for the data in the table above. (3 marks)
- c) Calculate the position of the Median. (3 marks)
- d) In which class interval does the median fall? (1 mark)
- e) Using a suitable scale, draw the graph of frequency versus class interval. (3 marks)
- f) On the same graph, draw the frequency polygon. (3 marks)
- g) Show on the above graph the position of the Median. (3 marks)

**QUESTION TWO (20 MARKS)**

The Chi-Square equation is given as:

- a) Explain the meaning of O, E, (O-E), (O-E)<sup>2</sup>. (4 marks)
- b) Study the data in the table below and calculate the expected values for each cell.

	HIGH PERFORMANCE	LOW PERFORMANCE	TOTAL
NATIONAL	300	100	400
COUNTY	100	300	400
SUB-COUNTY	50	350	400
TOTALS	450	750	1200

Use the information to fill the table below: (8 marks)

OBSERVED O	EXPECTED E	O-E	(O-E) <sup>2</sup>	(O-E) <sup>2</sup> /E
300				
100				
100				
300				
50				
350				

- i. Find the Chi-Square value by totaling the values in the last Column. (2 marks)
- ii. Calculate the degrees of freedom=(R-1) X (C-1). (3 marks)
- iii. How significant is the calculated value of Chi-Square at 95% confidence level? The CHI-SQUARE critical value is 5.991. (3 marks)

**QUESTION THREE (20 MARKS)**

a) Variance expression is given as: 
$$\text{Var.} = \frac{\sum fx^2 - \frac{(\sum fx)^2}{n}}{n-1}$$

Explain the symbols: X, X<sup>2</sup>, n, fX, fX<sup>2</sup>,  $\sum fx$ ,  $\sum fx^2$ . (3 marks)

- b) Study and complete the variance table below: (8 marks)

SCORE X	FREQUENCY f	Square score $X^2$	Frequency x score f X	Frequency x Square score f $X^2$
5	2			
8	4			
7	2			
6	3			
4	5			
2	2			
9	2			
10	2			
TOTALS	N= 22			

- c) Calculate the Variance for this data. (5 marks)
- d) Calculate the Standard deviation for this data. (4 marks)

#### QUESTION FOUR (20 MARKS)

Study the data below.

- a) Complete the table for cumulative frequency. (3 marks)

CLASS INTERVAL CI	MID-POINT X	FREQUENCY f	CUMULATIVE FREQUENCY Cf
0-10	5	3	
10-20	15	8	
20-30	25	15	
30-40	35	20	
40-50	45	50	
50-60	55	50	
60-70	65	20	
70-80	75	15	
80-90	85	8	
90-100	95	3	

- b) Draw a graph of cumulative frequency versus the class interval. (5 marks)
- c) Calculate the median position. (3 marks)
- d) Calculate the position of the 1<sup>st</sup> Quartile. (3 marks)
- e) Calculate the position of the 3<sup>rd</sup> Quartile. (3 marks)
- f) Show the position of the three quantities above on the cumulative frequency curve. (3 marks)

**QUESTION FIVE (20 MARKS)**

- a) Calculate the sum of the scores in the table below. (2 marks)
- b) Calculate the mean score. (2 marks)
- c) Complete the table for the data below. (8 marks)

	SCORE $X_i$	$(X_i - \text{MEAN OF } X)$	$(X_i - \text{MEAN OF } X)^2$
1	5		
2	8		
3	7		
4	6		
5	4		
6	2		
7	9		
8	10		
9	8		
10	5		
TOTAL			

- d) Find the sum of the square deviations. (2 marks)
- e) Calculate the variance in the scores. (3 marks)
- f) Calculate the standard deviation for the scores. (3 marks)