



# MACHAKOS UNIVERSITY

University Examinations for 2021/2022 Academic Year

DIRECTORATE OF TVET

SECOND YEAR FIRST TERM EXAMINATION FOR

DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY

2920/205/QM: QUANTITATIVE METHODS

DATE: 28/7/2022

TIME: 11.30-2.30 PM

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## INSTRUCTIONS

Answer all questions.

1. a) state three characteristics of mean as a measure of central tendency. (5 marks)
- b) with the aid of a frequency distribution curves differentiate between skewness and kurtosis (5 marks)
- c) the table below shows the consumption of electricity by 100 households during a particular week.

Consumption (kwh)	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79
Number of households	5	11	18	29	16	10	8	3

Determine the:

- i. Median
  - ii. Mode
  - iii. Standard deviation
  - iv. 69<sup>th</sup> percentile
  - v. 9<sup>th</sup> decile
  - vi. Interquartile range (20 marks)
2. a) Explain the following methods as used in fitting of a trend of a time series
    - i. Semi-averages method
    - ii. Moving -average method (6 marks)

3. The table below shows the sales details(in millions of kenya shillings) for Tinola stationeries ltd for the year 2012 to 2015 inclusive

Year	Quarter			
	1	2	3	4
2012	43	67	127	61
2013	45	87	153	65
2014	49	81	157	99
2015	57	81	187	109

Determine the

- i. Trend equation using the least squares method
  - ii. Estimated sales for the second quarter of the year 2016 (14 marks)
4. a) Table below shows heights of 40 students in a senior college

Weight (kg)	50-56	57-60	61-64	65-68	69-72	73-76	77-80
No of students	2	3	4	11	9	6	6

- i. Using an assumed mean of 66.5  
Determine
    - I. Mean
    - II. Standard deviation
  - ii. Calculate the coefficient of variation
  - iii. Determine the median (14 marks)
- b) state four principle components of a time series (4 marks)
5. a) a committee of 8 lecturers is to be formed out of 6 science, 8 arts teachers and a physical instructor. Determine the number of ways the committee can formed if:
- i. any teachers can be included in the committee (2 marks)
  - ii. there should be 3 science and 4 art teachers in the committee (4 marks)
- b) Rongers intends to invest a sum of ksh10,000 at an interest rate of 8.5% per year. Determine the amount of money that he will have after 3 years (4 marks)
- c) define the following terms as used in statistics
- i. Harmonic mean
  - ii. Geometric mean (6 marks)

- d) a bag contains 15 coupons marked with numbers 1 to 15. Once a coupon is drawn at random. Determine the probability that the number on the coupon is.
- greater than 10
  - is a multiple of 2 or 5 (6 marks)
6. a) the table below shows details of retail prices and standard quantities (weights) of four commodities; fuel, maize, sugar and cooking fat over a three year period (2008 and 2011)

commodity	Standard quantity	Price in ksh	
		2008	2011
	w	P <sub>0</sub>	P <sub>n</sub>
fuel	10	85	115
maize	15	60	150
sugar	8	100	140
Cooking fat	6	90	150

Calculate the:

- Weighted average of prices relatives
  - Weighted aggregate of price index (8 marks)
- b) the table below shows profit in million Kenya shillings obtained from different branches in various bank accounts of a certain the question that follows:

	Savings	Current	Fixed	Junior
Mombasa	25	30	35	15
Kisumu	18	22	30	10
Nakuru	20	26	22	12

Represent the data using the following

- Simple chart
- Percentage component bar chart (6 marks)