



# MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF MATHEMATICS AND STATISTICS

FIRST YEAR THIRD SEMESTER EXAMINATION FOR

CERTIFICATE IN SUPPLIES CHAIN MANAGEMENT

1903/102,1906/102-BUSINESS CALCULATIONS AND STATISTICS

DATE: 18/12/2020

TIME: 8.30-11.30 AM

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## INSTRUCTIONS

- . attempt all the questions
  - . must have a scientific calculator.
1. Ken earns ksh. 120 per hour. He works 8 hours every day. Calculate his total earnings if he worked 28 days a certain month (2 marks)
  2. An alloy is made up of copper, tin and phosphorous in the ratio 5:14:1, respectively. Calculate the mass of copper in 185 kg of the alloy. (2 marks)
  3. In the month of january 2011, a salesperson sold 3 motor vehicles, at ksh. 1,500,000, ksh. 750,000 and ksh. 2,000,000 respectively. He is paid a commission of 7% on sales. Determine the commission for that month. (2 marks)
  4. The length of a rectangular piece of land is 3 times as long as it width. The perimeter of the land is 56 calculate its length. (3 marks)
  5. A client is required to pay an insurance premium of ksh. 11, 250.the premium rate is ksh. 4.50 for every 1,000 of the value. Calculate the value of the insurance policy. (2 marks)
  6. A trader sold a radio for ksh. 9,000 and made a profit of 30% on cost. Calculate its cost price (2 marks)

7. a Kenyan exported goods worth ksh. 678,000 to Britain. Calculate the value of these exports in sterling pounds. (take 1 sterling pound =ksh. 122.04) (2 marks)
8. A business person intends to save a total ksh. 37, 500.she intends to save ksh. 1,500 in the first month and to increase her savings by ksh. 500 in every succeeding month. The savings for the last month will be expected to be ksh. 6,000. Determine the number of months it will take her to raise the amount. (4 marks)
9. The cash price of a bed is ksh. 6,500. Peter bought it on hire purchase by making a down payment of ksh. 2,300, followed by 12 monthly instalments of ksh. 490 each. Calculate the interest on hire purchase (4 marks)
10. Define the term index numbers as used in business decision making (2 marks)
11. Differentiate the function  $y = 2x^3 + 2$  with respect to x (2 marks)
12. State two limitations of using statistics in business decision making (2 marks)
13. The following information shows the income of 3 sectors in an economy
- | Sector      | income (ksh million) |
|-------------|----------------------|
| Agriculture | 380                  |
| Industry    | 240                  |
| Trade       | 160                  |
- Present this data inform of a pie chart. (4 marks)
14. Distinguish between primary data and secondary data (2 marks)
15. The following data shows the number of projects undertaken by 13 firms in a year  
2,4,4,5,8,4,2,4,8,10,20,16,6  
determine the modal number of projects (2 marks)
16. Explain the meaning of the term tabulation as used in classification of data (2 marks)
17. A regression equation is given by, $y = 1.10 + 1.30x$ . determine the value of y, given  $x=40$  (2 marks)
18. The following are the annual profits, in shillings, made by 10 jua kali traders.  
45, 32, 37, 46, 39, 36,41, 48, 36, 45.  
Determine the coefficient of range (3 marks)
19. State three characteristics of a normal distribution. (3 marks)

20. A machine was bought at ksh. 1,500,000.it depreciates at 20% every year. Calculate its value at the end of the third year (4 marks)

21. a) the following table shows the prices and quantities of wheat flour, rice and maize, per kilogram consumed by a household in the month of May 2005 and 2010.

Item	2005		2010	
	Price per kg in ksh	Quantity in kgs	Price per kg In ksh	Quantity in kgs
Wheat flour	45	8	60	6
Rice	65	16	115	14
Maize	20	12	30	15

Calculate;

- i. Laspeyre's price index
- ii. Paashe's price index
- iii. Fisher's price index (9 marks)

b) a French tourist visited USA with 24,600 Euros. He spent US \$ 900.he then proceeded to Kenya for his holiday where he spent ksh. 215,000. he then changed his remaining cash to Euros on his way back home. Determine the amount he received, in Euros (take 1 US\$=ksh 82.64 and 1 Euro=ksh 103.72) (7 marks)

22. a) Explain each of the following techniques of sampling:

- i. Simple random sampling
- ii. Stratified random sampling
- iii. Systematic random sampling
- iv. Multi-stage sampling (8 marks)

b) The following data shows the distribution of weekly incomes 108 randomly selected vegetable vendors in a town.

Income (ksh 100)	frequency
40-48	6

49-57	22
58-66	43
67-75	28
76-84	9

Calculate the;

- i. Mean
- ii. Mode
- iii. Standard deviation
- iv. Coefficient of variation (8 marks)

23. a) The following data shows the scores attained during an appraisal of eight employees by two departments, A and B in a firm:

Employees serial number	1	2	3	4	5	6	7	8
Department A	13	35	53	40	48	72	35	84
Department B	45	82	54	52	34	45	32	66

- i. Calculate the rank coefficient of correlation;
  - ii. Interpret the value in (i) above
- b) Ten percent of all pineapples in a consignment of 50 are known to be undersize. Two pineapples are randomly selected one at a time without replacement.
- i. Draw A Tree Diagram To Represent The Above Information
  - ii. Using (b) (i) above, calculate the probability that:
    - I None of the two selected are undersize
    - II Both of the pineapples selected are undersize
    - III Only one pineapple selected is undersize (6 marks)