



# MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

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## University Examinations 2013/2014

FIRST YEAR, FIRST SEMESTER EXAMINATION FOR CERTIFICATE IN BUSINESS  
ADMINISTRATION

**CBA 0102: BASIC BUSINESS MATHEMATICS**

**DATE: DECEMBER 2013**

**TIME: 1½ HOURS**

**INSTRUCTIONS:** Answer question *one* and any other *two* questions

### QUESTION ONE (30 MARKS)

a) Solve the following equations for x.

i.  $3(x + 5) = 2(-6 - x) - 2x$  (2 Marks)

ii.  $\frac{m-2}{m} + 1 = \frac{2m}{7}$  (3 Marks)

iii.  $\frac{2z}{z+3} = \frac{3}{z-10} + 2$  (3 Marks)

b) Factorise and solve  $4x^2 - 20x + 9 = 0$ . (5 Marks)

c) Find the 40<sup>th</sup> term and the sum of the first 40 terms of the arithmetic sequence 10, 8, 6, ... (5 Marks)

d) The following marks scored by 10 students in a maths test.

50, 54, 60, 70, 73, 61, 68, 50, 40, 52

Find:

i. The mode mark (1 Mark)

ii. The mean mark (3 Marks)

iii. The media mark (2 Marks)

e) i) Define a set. (2 Marks)

ii) Let  $A = \{a, b, c\}$ ,  $B = \{c, d, f\}$ . Find  $A \cup B$ ,  $A \cap B$  and  $(A \cap B) \cap (A \cup B)$ . (7 Marks)

### QUESTION TWO (20 MARKS)

a) the following are marks of 20 students in a mathematics exam

Class	Frequency
0-9	3
10-19	3
20-29	4
30-39	2
40-49	3
50-59	5

Use the data to compute

- i. Arithmetic mean. (2 Marks)
  - ii. Median (4 Marks)
  - iii. Modal class (1 Mark)
  - iv. Variance (4 Marks)
  - v. Standard deviation (1 Mark)
- b) given the sequence 4, 20, 100,.... Evaluate  $T_9$  and  $S_9$ . (4 Marks)
- c) solve  
 $2x + 3y = 5$   
 $3x + 5y = 7$  by substitution. (4 Marks)

**QUESTION THREE (20 MARKS)**

- a) Solve for y in  $\frac{5}{2y-6} = \frac{10-y}{y^2-6y+9}$ . (6 Marks)
- b) Given that  $20 = 60 \left(1 - e^{-t/2}\right)$  determine the value of t, correct to 3 significant figures. (3 Marks)
- c) Factorise the expression  $x^2 - 42x + 320$  and solve for x. (4 Marks)
- d) John deposits ksh. 100,000 which earns simple interest at a rate of 10% p.a. Determine
  - i. The interest after 3 years. (3 Marks)
  - ii. The total amount in the bank after 3 years. (1 Mark)
- e) The 6<sup>th</sup> term of an AP is 17 and the 13<sup>th</sup> term is 38. Determine the 19<sup>th</sup> term. (3Marks)

**QUESTION FOUR (20 MARKS)**

- a) Solve for each of the following and check your answer
  - i.  $\frac{4t}{t^2-2t} = \frac{1}{5-t}$  (4 Marks)
  - ii.  $\frac{3y+4}{y-1} = 2 + \frac{7}{y-1}$  (4 Marks)
- b) A widget is being sold in a store for \$13540 and has been marked up 7%. How much did the store pay for the widget? (3 Marks)
- c) Solve the equation  $t^2 - 10t + 34 = 0$ . (5 Marks)
- d) Solve  $\begin{matrix} 3x + 2y = 12 \\ 5x - 4y = -2 \end{matrix}$  by elimination method.

**QUESTION FIVE (20 MARKS)**

- a) The width of a rectangle is 1m less than twice the length. If the area of the rectangle is  $100\text{m}^2$  what are dimensions of the rectangle. (4 Marks)
- b) We have \$10,000 to invest for 44 marks. How much money will we have if we put the money in the bank account that has an annual interest of 5.5% and interest is compounded annually. (3 Marks)
- c) Given 1001, 1002, 1102, 1001, 1201, 1230 calculate
- i. Mode (1 Mark)
  - ii. Mean (3 Marks)
  - iii. Median (1 Mark)
- d) A geometric sequence is given as  
10, 5, 2.5, ...  
Find
- i. The next 2 terms (2 Marks)
  - ii. The sum of the first 10 terms (4Marks)
- e) A shirt is on sale \$15.00 and has been marked down 35%. How much was the shirt being sold for before the sale? (2 Marks)