MASINDE MULIRO UNIVERSITY OF

SCIENCE AND TECHNOLOGY

(MMUST)

MAIN CAMPUS

UNIVERSITY EXAMINATIONS 2022/2023 ACADEMIC YEAR

DIPLOMA SECOND SEMESTER EXAMINATIONS

(MAIN EXAM)

FOR THE DIPLOMA OF SCIENCE IN:

Disaster management

COURSE CODE: SEC/CU/DM/BC/02/6

COURSE TITLE: NUMERACY SKILLS

DATE: 11 DECEMBER, 2023 **TIME: 9-11AM**

INSTRUCTIONS TO CANDIDATES (MAY INTAKE)
ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS AS PER THE POLICY
TIME: 2Hours

MMUST observes ZERO tolerance to examination cheating

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This Paper Consists of 7 Printed Pages. Please Turn Over.

1. **(a)** Mathematics is often likened to discrete *wise sayings* while Numeracy is overly likened to *wisdom*.

i) State two differences between Numeracy and Mathematics. **(2 marks)**

ii) Numbers are an integral part of Mathematics and Numeracy. What do you understand by the following terms? **(3 marks)**

    I. Integers -

    II. Real numbers -

    III. Irrational numbers -

iii) It is a fact that light travels at a speed of **300,000,000 m/s**; which translates to **9,460,800,000,000,000 m/year**. This latter figure is inconvenient not only to write, but also to pronounce. Simplify it using the scientific notation. **(1 mark)**

iv) What are algorithms as applied in Numeracy? Give one example of algorithms. **(2 mark)**

(b) There were 36 workers present in a farewell party for the outgoing Company MD. 250ml of red wine was budgeted for each worker. How many 1 litre cartons of the red wine were needed?

(2 marks)

(c) Eleven Matatu operators jointly win an award of 4271 Sterling pounds at the end of a working year. They unanimously agree to share the money equally. How much will each of the eleven operators receive? **(2 marks)**

(d) Marrion sold 160 copies of of the daily news paper for 250 shillings each, 180 pieces of MMUST news paper for 200 shillings each, and 10 sports magazine for 400 shillings each. How much did she collect in all? **(3 marks)**

(e) Simplify:

    i) $\dfrac{py - px}{nx - ny}$ ii) $a^2b - 2b^3c + 3a^2b + b^3c$ **(4 marks)**

(f) Convert the following percentages into fractions:

    i) 75%   ii) 256%   **(2 marks)**

(g) A gun dealer has 58 sleek black automatic rifles. If 38 of them are fully loaded, what proportion of the guns are not fully loaded? Give your answer as a decimal to two decimal places. **(2 marks)**
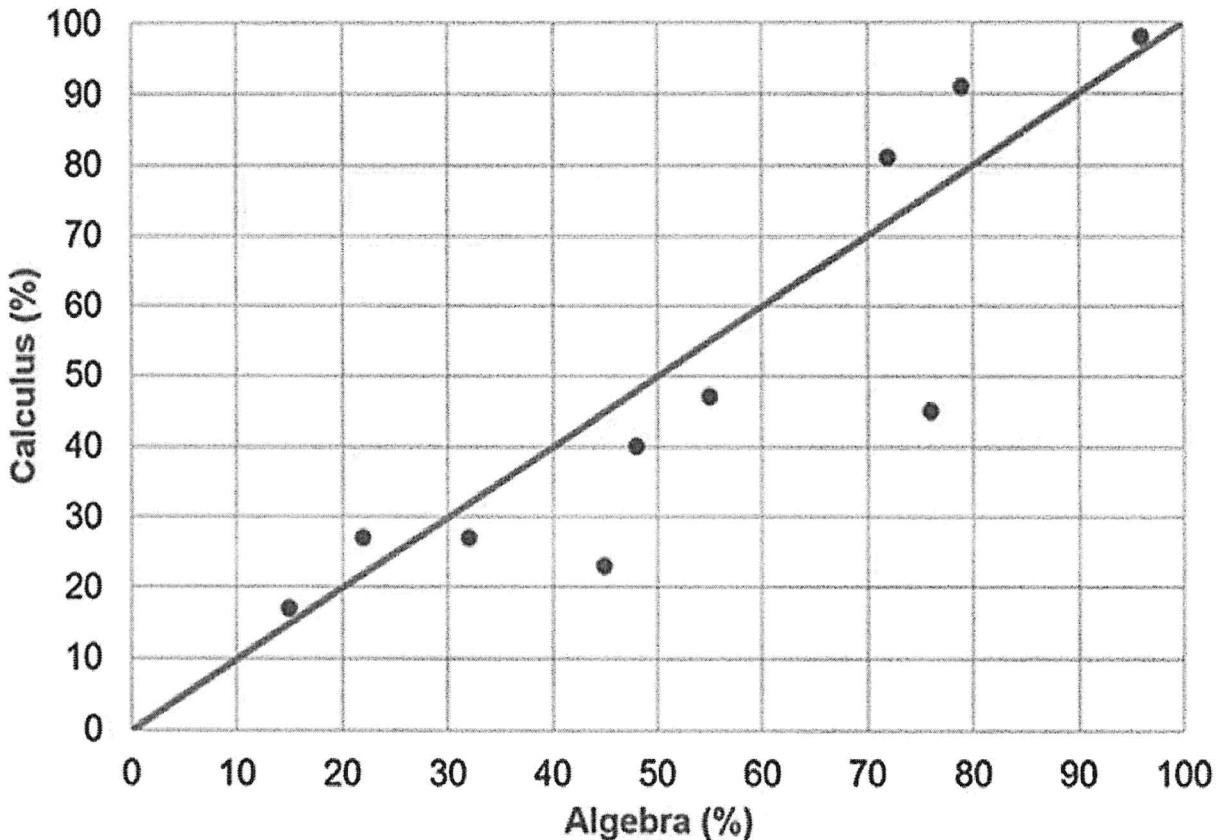
(h) A rectangular field is 0.5m longer that it is wide.
    i) If its length is 8m, find its perimeter. **(2 marks)**

ii) When the breadth of the rectangle is reduced by 0.5m, the length is increased such that the perimeter is increased by 1/4 of its original value. What is the change in the length of the rectangle? **(2 marks)**

(i) A class of ten A-level Maths students in Makini school individually sat for two papers. The first paper was an Algebra paper and the second was Calculus. The percentage scores of both papers are shown on the scatter graph below. What proportion of the class scored higher in Algebra than Calculus? Give your answer as a decimal. **(2 marks)**

(j) Which of the following is a base unit? (1 mark)

a) mg   b) cm   c) kg   d) dm   e) km

2. (a) State 4 techniques of sampling and for each list one advantage and one disadvantage of using it. (10 marks)

(b) The masses of 40 students were measured to the nearest kilogram and recorded as shown

Mass in kg	41 – 45	46 – 50	51 – 55	56 – 60	61 – 65
Frequency	5	10	14	8	3

(a) Modify this table to calculate the mean mass (6Marks)

(b) Draw a frequency polygon for the distribution   **(4Marks)**

3. Four towns P, Q, R and S are such that town Q is 120km due East of town P. Town R is

160km due North of town Q. Town S is on a bearing of 330^0 from P and on a bearing of

300^0 from R

a) i) Draw a sketch to show the relative positions of the town.   **(1mark)**

ii) Using a ruler and a pair of compasses only, show the relative positions of towns P, Q, R and S.

Take a scale of **1 cm rep 50km**.   **(5 marks)**

b) determine
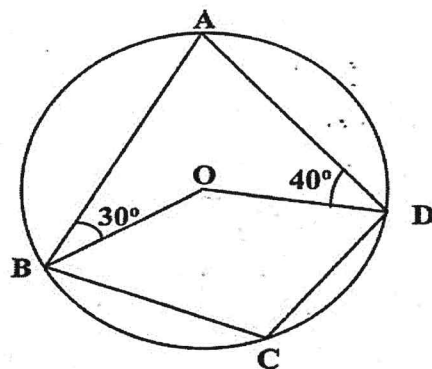
      i) the distance **SP** in km   **(2 marks)**

      ii) the bearing of **S** from **Q**   **(2 marks)**

c) In the figure below, ABCD is a cyclic quadrilateral. Point O is the centre of the circle.

Angle ABO = 30^0 and angle ADO = 40^0. Calculate the sizes of

i) angle BCD.   **(2 marks)**

ii) angle BAD   **(2 marks)**

d) A two-digit number is such that, the sum of its digits is 13. When the digits are

interchanged, the original number is increased by 9. Find the original number. **(4 marks)**

e) Use a calculator to work out $\dfrac{2}{0.6742} + \dfrac{12}{0.167}$ **(2 marks)**

4. (a)A cylindrical can of diameter 20 cm and height 60cm is filled with water using a cylindrical jar of diameter 10 cm and height 8 cm. How many jarfuls will fill the can?

(5 marks)

(b)Find the surface area of an isosceles triangular prism of length 28 cm, height 3.5 cm and base 7 cm. **(5 marks)**

(c) All odd numbers less than ten are arranged in descending order to form a number
(i)Write down the number formed **(2 marks)**

(ii)State the total value of the second digit in the number formed in (i) above **(2 marks)**

(iii)Express 5400 in terms of its prime factors. **(1 mark)**

d) The size of an interior angle of a regular polygon is 144°. Find the number of sides of the polygon and hence the sum of its interior angles. **(3 marks)**

e) In a mixed day school the ratio of boys to girls is 7:9. In one of the form 2 classes, of 60 students, a fifth of the boys and two seventh of the girls take physics. How many students in that form 2 class take Physics. **(2 marks)**