MACHAKOS INSTITUTE OF TECHNOLOGY

MACHAKOS TOWN CAMPUS

SCHOOL OF HEALTH AND APPLIED SCIENCES

CERTIFICATE IN NUTRITION, CERTIFICATE IN LAB SCIENCES

MODULE 1

END OF SEMESTER EXAMINATIONS

JAN - APRIL 2021

MATHEMATICS

KNEC 1905/101, 1904/101

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

1. *This paper has **SEVEN** questions.*
2. *Answer any **FIVE** questions in this paper.*
3. *Any examination **IRREGULARITY** will lead to **DISQUALIFICATION.***
4. *Indicate your **FULL ADMISSION NUMBER** in each Answer Sheet used.*
5. *Cell phones are **NOT** allowed in the examination room.*

QUESTION ONE

Write the following fractions in words :

(a) ¾
(b) $^{5}/_{17}$
(c) $^{11}/_{30}$
(d) $^{6}/_{23}$
(e) $^{37}/_{124}$
(f) $^{23}/_{50}$
(g) $^{6}/_{7}$
(h) $^{7}/_{10}$
(i) $^{3}/_{100}$
(j) $^{3}/_{5}$

(20mks)

QUESTION TWO

(i) Find the length of an arc subtending an angle of 120 degrees at the centre of a circle of radius 7cm.Take = $^{22}/_{7}$

(5mks)

(ii) Find the area of a sector of a circle of radius 3 cm if the angle subtended at the centre is 140 degrees. Take = 3.142 (5mks)

(iii) The area of a sector of a circle is 38.5 cm^2.Find the radius of the circle if the angle subtended at the centre is 90 degrees. Take = $^{22}/_{7}$ (5mks)

(iv) A sector of a circle of radius r makes an angle ⌖(theta) at the centre. Calculate the area of a sector if: r=1.4 cm, ⌖(theta) = 30 degrees (5mks)

QUESTION THREE

(a) Simplify where possible.

(i) 2a + 3b + 4ab
(ii) 7t + 2p + 3t + 5p
(iii) 6x – 9x – 2y + 9y
(iv) -4z – 7d + 2z
(v) -10k + 2m – 3k -5m

(20mks)

QUESTION FOUR

The following is the distribution of weights of parcels delivered by a courier service company during a certain month:

Weight (kgs)	**Frequency (f)**
110 – 119	5
120 - 129	7
130 – 139	12
140 – 149	20
150 – 159	16
160 – 169	10
170 – 179	7
180 – 189	3

Calculate the:

(i) Prepare a frequency distribution table for the above data (5mks)
(ii) Mean weight (5mks)
(iii) Median weight (5mks)
(iv) Modal weight (5mks)

QUESTION FIVE

(i) A triangle has vertices A (2, 5), B (1,-2) and C (-5, 1).Determine:

(a) The equation of the line BC. (4mks)

(b) The equation of the perpendicular line from A to BC. (4mks)

(ii) Determine the gradient and the y axis intercept without drawing the line.

(a) $3y = 7x$
(b) $3y = 7$
(c) $2y = 6x + 1$
(d) $7 - 2x = 4y$ (12mks)

QUESTION SIX

In a rectangle ABCD, the equation of the line AB is $y = x + 6$. The x co-ordinate of A is -3. The line AD is parallel to the line $y + 3x = 7$. If C has the co-ordinates (2, 6), determine:

(a) The equation of lines AD, BC and CD.
(b) The co-ordinates of A, B and D.
(c) The equations of the diagonals.

(20mks)

QUESTION SEVEN

(a) The volume of the material used to make a cube is 1728 cm^2. Find the length of the cube. Find the length of the cube.

(5mks)

(b) Solve the following linear equation

$4(x + 5) - 6(2x + 3) = 3(x + 14) - 2(5 - x) + 9$ (3mks)

(c) Variable y is inversely proportional to x^2, and $y = 5$ when $x = 2$. Calculate:

(i) y when $x = 5$

(ii) x when y = 8 (6mks)

(a) T varies inversely as √S. If T=15 when S=36,calculate:

(i) T when S=49

(ii) S when T =10 (6mks)