MID- TERM EXAM-2024

FORM 2 Marking scheme

1.	NO	STD	LOG	M1	
	72.56	$7.256X10^{1}$	1 .8607		
	0.64	$6.4X10^{-1}$	$\overline{1}$ .8062		
	1.845	$1.845X10^{0}$	1.6669 0.2660×2 0.5320	M1	
	2.390	2.390×10^{0}	$1.1349\times{}^{1}/_{3}$ 0.3783	M1 A1	
2.	X+X+2+X+4=219 3X=213 X=71 71,73,75			M1 M1 A1	
3.	a) 100000x77.24 Ksh. 7724000 b) $\frac{7724000}{122.24}$ =63171.669 sterling pound			M1A1 M1A1	
4.	$\frac{1}{3}$X3.142X25X12 $=314.2cm^2$ $314.2= 3.142X\frac{4}{3}r^3$ $r^3=75$ r=4.217cm $S.A =4x3.142x4.142^2$ $=223.52cm^2$			M1 M1 M1 A1	
5.	$\frac{12X240}{60}$ =42			M1 A1	

<table>
<tr><td>6.</td><td>$6x^2-13x+6=0$
-9,-4
$6x^2-4x-9x+6=0$
$2x(3x-2)-3(3x-2)=0$
$X=\frac{3}{2}$ or $x=\frac{2}{3}$</td><td></td><td>M1

M1

A1</td></tr>
<tr><td>7.</td><td>$4X\frac{1}{\sqrt{2}}X\frac{\sqrt{3}}{2}$
$\frac{2\sqrt{3}}{\sqrt{2}}$</td><td></td><td>M1
A1</td></tr>
<tr><td>8.</td><td>NO
11.45
Sin38.3

7.096</td><td>STD
$1.145x10^1$

$7.096x10^0$</td><td>LOG
1.0588
$\overline{1}$ .7922
0.8510</td><td>M1

M1

A1</td></tr>
<tr><td>9.</td><td>$185.1=9x0.5Xa^2sin40$
$\frac{185.1}{4.5sin40}=a^2$

$575.93=a^2$
A=8cm</td><td></td><td>M1
M1

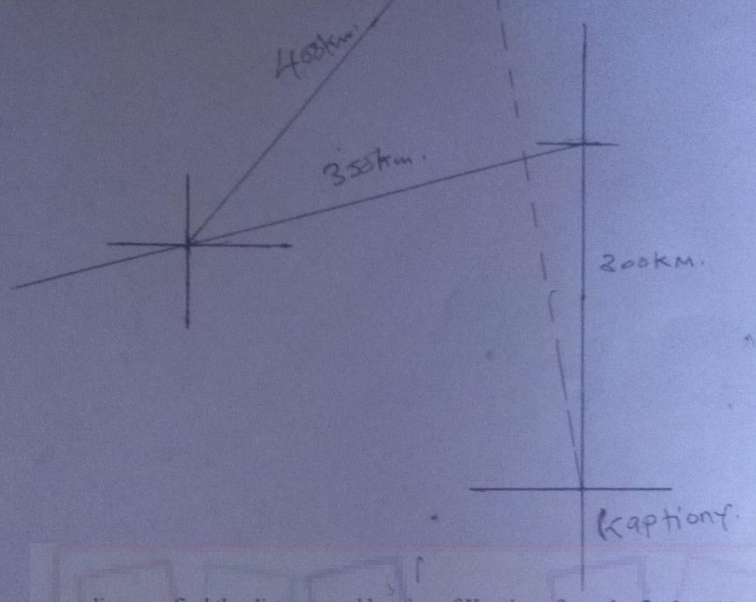
A1</td></tr>
<tr><td>10.</td><td></td><td></td><td></td></tr>
</table>

SECTION II (30 MARKS)

Answer ANY THREE Questions from this section in the spaces provided

10. An helicopter flies from Kaptiony due south for 300km. It then flies on a bearing of 255^0 for 350km. From there it flies on a bearing for 040^0 for 400km.

(i) Draw an accurate diagram showing the journey of the helicopter using a scale of 1:5000000. (5mks)



(ii) From your diagram, find the distance and bearing of Kaptiony from the final position of the helicopter. (2mks)

350°

10.4×50

520KM.

(iii) Given that the helicopter flies at a steady speed of $200kmh^{-1}$, find how long the whole journey took. (3mks)

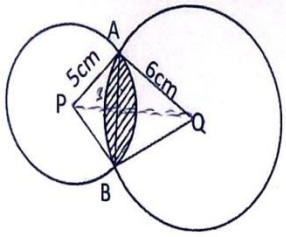
Total distance 400+350+300

1050

200

5 hours 15 seconds

11. The figure below shows two intersecting circles with centres P and Q and radius 5cm for the small one and 6cm for the big one. AB is a common chord of length 8cm. Calculate;



(a) the length of PQ (1 mark)

$5^2+6^2 = 7.81\text{cm}$

(b) the size of;

(i) angle APB (2marks)

$\sin\theta = \frac{4}{5}$

$\theta = \sin^{-1}(0.8)$

$\theta = 53.1312$

$\angle APB = 106.26^\circ$

(ii) angle AQB (2 marks)

$\sin\theta = \frac{4}{6}$

$\theta = \sin^{-1}(0.6667)$

$\theta = 41.81 \times 2$

$\theta = 83.62^\circ$

(c) the area of the shaded region(5 marks)

$\left(\frac{\theta}{360}\pi r^2 - \frac{1}{2}ab\sin\theta\right) + \left(\frac{\theta}{360}\pi r^2 - \frac{1}{2}ab\sin\theta\right)$

$\left(\frac{106.26}{360} \times \frac{22}{7} \times 5 \times 5 - \frac{1}{2} \times 5 \times 5 \sin 106.26\right) + \left(\frac{83.62}{360} \times \frac{22}{7} \times 6 \times 6 - \frac{1}{2} \times 6 \times 6 \sin 83.62\right)$

$(23.19 - 12) + (26.28 - 17.89)$

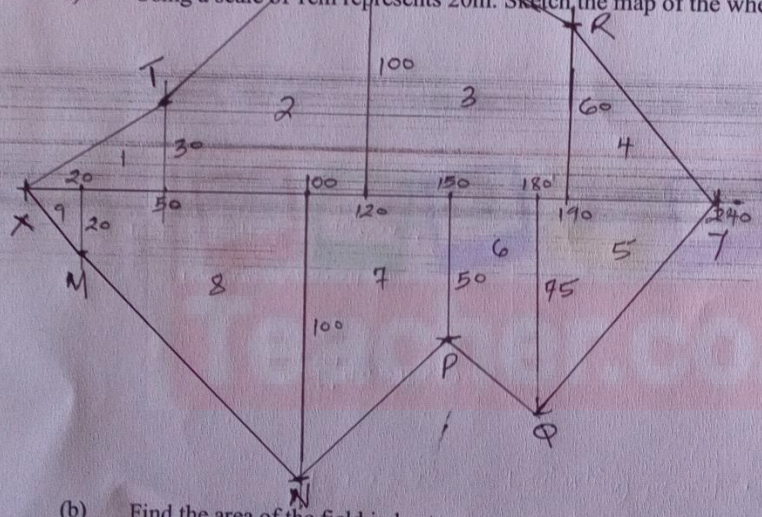
$11.19 + 8.39$

$= 19.58\text{cm}^2$

12. Below are the measurements of a wheat field using a baseline XY recorded in metres.

	Y	
	240	
TO R 60	190	
	180	75 TO Q
	150	50 TO P
TO S 100	120	
	100	100 TO N
TO T 30	50	
S	20	20 TO M
	X	

a) Using a scale of 1cm represents 20m. Sketch the map of the wheat field. (4mks)



(b) Find the area of the field in hectares. (4mks)

1 → A = ½bh = ½×50×30 = 750M²

2 → ½×130×70 = 4,550M²

3 → ½×160×70 = 5,600M²

4 → ½×50×60 = 1500M²

5 → ½×60×75 = 2250M²

6 → ½×125×30 = 1875M²

7 → ½×150×50 = 3750M²

8 → ½×120×80 = 4800M²

9 → ½×20×20 = 200M²

T.A = 2.5275

(c) If the cost of one hectare is sh65,000 find the cost of the wheat field. (2mks)

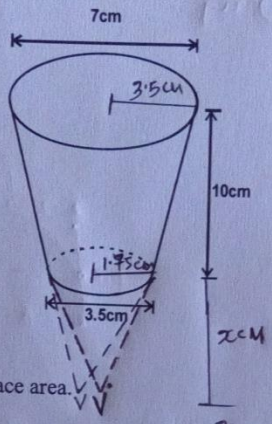
If 1ha = 65,000

∴ (2.5275 × 65,000 / 1) Ksh.

= Ksh. 164,287.5.

13.

13. The figure below shows a glass in form of a frustum of a cone whose top and bottom diameter of 7cm and 3.5cm respectively. Its depth is 10cm. Taking $\pi = \frac{22}{7}$,



Calculate;

a) Its total surface area. (5 marks)

$S.A = \pi RL - \pi rL + \pi R^2 + \pi r^2$.

$\frac{H}{h} = \frac{R}{r}$.

$\frac{10+x}{x} = \frac{3.5}{1.75}$

$17.5 + 1.75x = 3.5x$.

$17.5 = 1.75x$

$x = 10$ cm.

$c^2 = a^2 + b^2$.

$L^2 = 400 + 12.25$

$= 412.25$

$L = 20.304$ cm.

$\therefore \frac{H}{h} = \frac{L}{l}$.

$\frac{20}{10} = \frac{20.304}{l}$

$20l = 203.04$

$l = 10.152$cm.

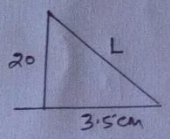
$\therefore \frac{22}{7} \times 3.5 \times 20.304 - \frac{22}{7} \times 1.75 \times 10.152$

$= 223.344 - 55.836$

$= 167.508 + (\frac{22}{7} \times 3.5 \times 3.5) + (\frac{22}{7} \times 1.75 \times 1.75)$

$= 167.508 + 9.625$

$= 177.133 cm^2$.



b) Its capacity. (5 marks)

$Vol = \frac{1}{3}\pi R^2 H - \frac{1}{3}\pi r^2 h$.

$= (\frac{1}{3} \times \frac{22}{7} \times 3.5 \times 3.5 \times 20) - (\frac{1}{3} \times \frac{22}{7} \times 1.75 \times 1.75 \times 10)$

$= 256.667 cm^3 - 32.083 cm^3$

$= 224.584 cm^3$.