BRILLIANT EDUCATIONS

BRILLIANT PUBLISHERS
Tel: +254711-410-583
The Sign of Knowledge

Jr. Stephen O. Oketch

Name: ……Index no ……..….....
School: ……..…… Candidate's sign ……
Date: ……
121/1
MATHEMATICS **TRIAL II**

PAPER 1 **BRILLIANT PUBLISHERS PRE-MOCK 2020**

APRIL Kenya Certificate of Secondary Education (Kcse)

TIME: 2½ HOURS

INSTRUCTION TO CANDIDATE'S:

1. *Write your **name**, **admission number**, **class** and **date** in the spaces provided above.*
2. *This paper consists of **two** Sections; Section **I** and Section **II**.*
3. *Answer **ALL** the questions in Section **I** and any **five** questions from Section **II**.*
4. *All answers and working must be written on the question paper in the spaces provided below each question.*
5. *Show all the steps in your calculation, giving your answer at each stage in the spaces provided **below** each question.*
6. *Marks may be given for correct working even if the answer is wrong.*
7. *Non-programmable silent electronic calculators and KNEC Mathematical tables **may be** used, except where stated otherwise.*
8. *Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.*
9. *Candidates should answer the questions in English.*

FOR EXAMINER'S USE ONLY:

SECTION I

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	TOTAL

SECTION II

17	18	19	20	21	22	23	24	TOTAL

GRAND TOTAL

SECTION I: (50 MARKS)
Answer all the question in this section in the spaces provided.

1. Without using a calculator , evaluate: $\frac{\frac{3}{4}+1\frac{2}{7}\div\frac{3}{7}\ of\ 2\frac{1}{3}}{\frac{2}{3}\left(1\frac{2}{7}-\frac{3}{8}\right)}$ (3 mks)

2. Simplify completely. $\frac{3x^2-xy-2y^2}{18x^2-8y^2}$ (3 mks)

3. The price of an article is marked as 12,000/= Mr. Omanga sold the article at a discount of 10% and still made a profit of 8%. Calculate the cost of the article. (3 mks)

4. Three sirens wail at intervals of thirty minutes, fifty minutes and sixty minutes. If they wail together at 7.18 a.m. on Monday, what time and day will they wail together?(3 mks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

5. The table shows the frequency distribution of marks scored by students in a test.

Marks	Frequency
21 - 30	2
31 - 40	4
41 - 50	11
51 - 60	5
61 - 70	3

Determine the median mark correct to one decimal point. (3 mks)

6. A cylindrical solid whose radius and height are equal, has a total surface area of $154cm^2$. Calculate the diameter. (3mks).

7. The exterior angle of a regular polygon is $(\chi - 50)°$ and the interior angle is $(2\chi + 20)°$. Find the number of sides of the polygon. (3 mks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

8. Solve the following inequalities and represent it on the number line.
$6x + 2 < 3x + 11 \leq 27x - 1$ Write down the integral values that satisfy the inequality.
(3mks)

9. Find the equation of a line through the point (2, 1), perpendicular to the line $\frac{1}{2}x + 2y = -3$
(3 mks)

10. Find the value of x given that; $9^x + 2 \times 3^{2x} - 243 = 0$ (3mks).

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

11. The position vectors of A and B are given as OA = 2**i** – 3**j** + 4**k** and OB= -2**i** – **j** + 2**k** respectively. Find to 2 decimal places, the length of vector **AB**. (4 mks)

12. Use the exchange rates below to answer the question.

	Buying	Selling
1 us Dollar	63.00	63.50
1 Euro	125.30	125.43

A tourist arriving in Kenya from Britain has 9600 Euros. He converts the Euros to Kenya shillings at a commission of 5%, while in Kenya he converts the money to US dollars. If he was not charged any commission from the last transaction, calculate to the nearest USA dollar what he received. (3mks).

13. Given that $\sin(2x - 10)^o = \cos 60^o$ and x is an acute angle, find x. (3 mks)

14. The length of a rectangle is (3x+1)cm. Its width is 3cm shorter than the length. Given that area of the rectangle is 28cm^2, find its length. (3 mks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

15. The mass of two similar solid are 324g and 768g. Find
    a) height of the smaller solid if the height of the bigger solid is 20cm. (2 mks)

    b) the surface area of the smaller solid if the surface area of the bigger solid is 40cm^2.
    (2 mks)

16. The cost of three pens and five books is sh. 130. Kanyoro bought 2 of the pens and 3 of the books at sh. 80. How much did he pay for each? (3mks)

SECTION II (50mks)

Answer only *five* questions in this section in the spaces provided.

17. A bus left Nairobi at 7a.m and travelled towards Eldoret at an average speed of 80km/h. At 7:45 a.m a car left Eldoret towards Nairobi at an average speed of 120 km/h. Given that the distance between Nairobi and Eldoret is 300km,
    Calculate:
    (a) The time the bus arrived at Eldoret. (2 mks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

(b) The time of the day, the two met. (3 mks)

(c) The distance from Nairobi to where the two met. (2 mks)

(d) The distance of the bus from Eldoret when the car arrived in Nairobi. (3 mks)

18. The following measurements were recorded in a field book using XY as the base line.
XY = 400m.

		Y		
C	60	340		
		300	120	D
		240	160	E
		220	160	F
B	100	140		
A	120	80		
		X		

(a) Using a scale of 1: 4000, draw an accurate map of the farm. (4 mks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

(b) Determine the actual area of the farm in hectares. (4 mks)

(a) If the farm is on sale at sh.80,000 per hectare, find how much the farm costs. (2 mks)

19. Mr. Omwega is employed. His basic salary is Kshs. 21, 750 and is entitled to a house allowance of Kshs 15, 000 and a travelling allowance of Kshs 8, 000 per month. He also claims a personal monthly relief of Kshs 1, 056 per month. Other deductions are;
Union dues Kshs 200 and Co-operative shares Kshs 4, 500 per month.
The table below shows the tax rates for the year.

Income (Kshs per annum)	Tax rates
1 – 116, 600	10%
116, 161 – 225, 600	15%
225, 601 – 335, 040	20%
335, 041 – 444, 480	25%
Over 444, 480	30%

Calculate;

a) Mr. Omwega's annual taxable income. (2 mks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

b) The tax paid by Mr. Omwega in the year. (6 mks)

c) Mr. Omwega's net income per month. (2 mks)

20. A straight line L_1 has a gradient $-\frac{1}{2}$ and passes through point P (-1, 3). Another line L_2 passes through the points Q (1, -3) and R (4, 5). Find.

(a) The equation of L_1. (2 mks)

(b) The gradient of L_2. (1 mk)

(c) The equation of L_2. (2 mks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

(d) The equation of a line passing through a point S (0, 5) and is perpendicular to L_2 (3 mks)

(e) The equation of a line through R parallel to L_1. (2 mks)

21. A ship leaves port P and sails to port Q which is 80km away on a bearing of 040°. The ship then sails from Q to R on a bearing 160° where R is 150km from Q. From R, the ship returns directly to P at a speed of 25km/h.
    a) Using a suitable scale show the relative positions of P, Q and R. (3 mks)

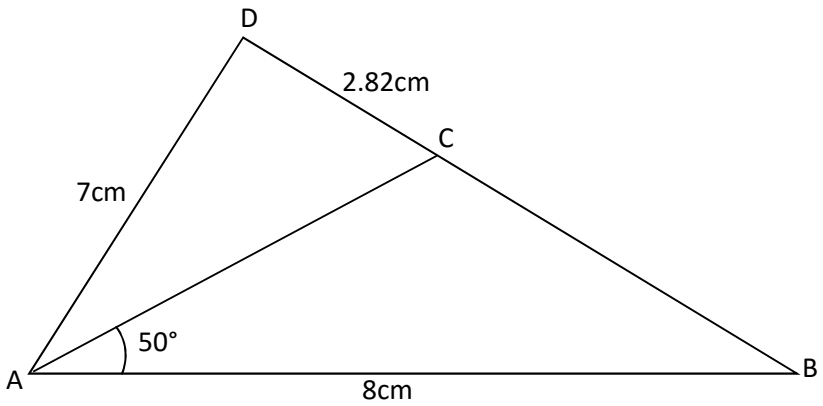
    b) Find the bearing of R from P (2 mks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

c) Find the distance travelled from R and the time taken to arrive at the destination(3 mks)

d) An island S is equidistant from P, Q and R. Show its relative position. (2 mks)

22. In the figure **below** (not drawn to scale) AB = 8cm, AC = 6cm, AD = 7cm, CD = 2.82cm and angle CAB = 50°.



Calculate (to 2d.p.)

a) The length BC. (3 mks)

b) The size of angle ABC. (3 mks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

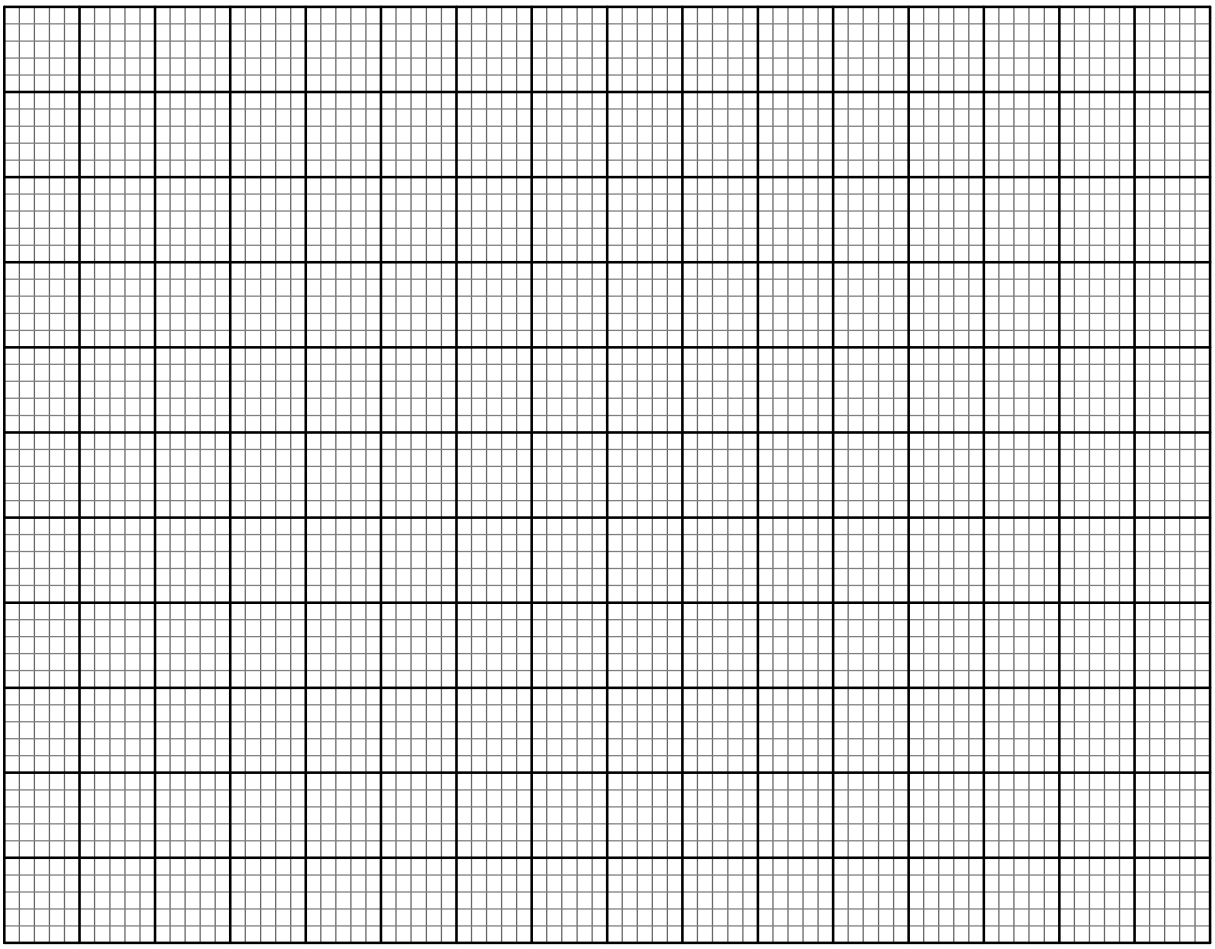
c) Size of angle CAD. (2 mks)

d) Calculate the area of triangle ACD. (2 mks)

23. Complete the table for the function $y = 1 – 2x - 3x^2$ in the range $-3 \leq x \leq 3$ (2 mks)

X	-3	-2	-1	0	1	2	3
$-3x^2$	-27		-3	0		-12	
-2x		4		0			-6
1	1	1	1	1	1	1	1
Y	-20			1		-15	

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com



b) Using the table above and the graph paper provided, draw the graph of
$y = 1 – 2x – 3x^2$ (4 mks)

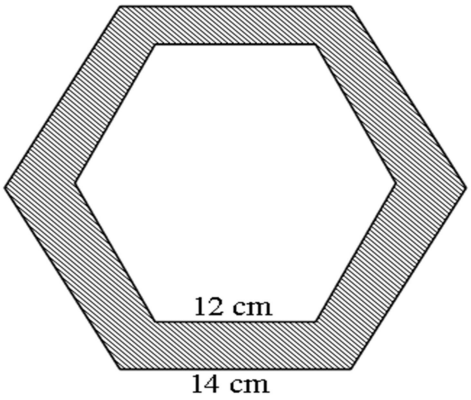
c) Use the graph in (b) above to solve

i) $1 – 2x – 3x^2 = 0$ (2 mks)

ii) $2 – 5x – 3x^2 = 0$ (2 mks)

24. The diagram below (not drawn to scale) shows the cross – section of a hexagonal solid metal prism length 20cm.

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com



Calculate;

a) The area of the shaded region (Take hexagon to be regular). (5 mks)

b) The volume of the material used to make the metal in cm^3. (2 mks

c) If the density of the metal prism is 3.5 g/ cm^3, find its mass in kg. (3 marks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

BRILLIANT PUBLISHERS
Tel: +254711-410-583
The Sign of Knowledge
Tr. Stephen O. Oketch

Name: ……Index no ……..…..
School: ……..…… Candidate's sign ……
Date: ……
121/2
MATHEMATICS **TRIAL II**
PAPER 2 **BRILLIANT PUBLISHERS PRE-MOCK 2020**

APRIL Kenya Certificate of Secondary Education (Kcse)
MATHEMATICS
PAPER 2
TIME: 2½ HOURS

INSTRUCTION TO CANDIDATE'S:

10. *Write your **name**, **admission number**, **class** and **date** in the spaces provided above.*
11. *This paper consists of **two** Sections; Section **I** and Section **II**.*
12. *Answer **ALL** the questions in Section **I** and any **five** questions from Section **II**.*
13. *All answers and working must be written on the question paper in the spaces provided below each question.*
14. *Show all the steps in your calculation, giving your answer at each stage in the spaces provided **below** each question.*
15. *Marks may be given for correct working even if the answer is wrong.*
16. *Non-programmable silent electronic calculators and KNEC Mathematical tables **may be** used, except where stated otherwise.*
17. *Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.*
18. *Candidates should answer the questions in English*

FOR EXAMINER'S USE ONLY:

SECTION I

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	TOTAL

SECTION II

17	18	19	20	21	22	23	24	TOTAL

GRAND TOTAL

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

SECTION I: (50 MARKS)

Answer all the question in this section in the spaces provided.

1. Use logarithm tables only correct 4 d.p to evaluate: (4 marks)

$$\frac{10^{0.8043} \times \log 4.948}{\sqrt{0.004636}}$$

2. Find the centre and radius of a circle with equation:
   $\chi^2 + y^2 - 6\chi + 8y - 11 = 0$ (3 marks)

3. If $(M + n) : (M - n) = 8 : 3$. Find the ratio M: n. (3 marks)

4. Find the values of x that satisfies the equation
   $\text{Log}(x + 5) = \log 4 - \log (x + 2)$ (3 marks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

5. The co-ordinates of the points A, B and C are (0,-4), (2, -1) and (8, 8) respectively. Use vector method to show that the points are collinear. (3 marks).

6. W varies directly as the cube of x and inversely as y. Find W in terms of x and y given that W = 80 when x = 2 and y = 5. (3 marks)

7. Without using mathematical tables, simplify in the form $a\sqrt{b}$ (3 marks)

$$\frac{2}{3-\sqrt{7}} - \frac{2}{3+\sqrt{7}}$$

8. Expand $(2 + x)^5$ in ascending powers of x up to the term in x^3. Hence approximate the value of $(2.03)^5$ to four significant figures. (3 marks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

9. A clothes dealer sold 3 skirts and 2 trousers for sh. 840. He also sold 4 shirts and 5 trousers for Ksh. 1680. Form a matrix to represent the above information ; hence find the cost of 1 shirt and 1 trouser. (3 marks)

10. Mumbua bought two grades of rice, grade A and grade B. She bought grade A at Sh. 42 per kg and grade B at Sh. 21 per kg. If she sold the mixture of the two grades at Sh. 39 per kg making a profit of 30%, at what ratio should she mix the two grades? (3 Marks)

11. In a transformation, an object with an area of 5 cm^2 is mapped onto an image whose area is 30 cm^2. Given that the matrix of the transformation is $\begin{bmatrix} x & x-1 \\ 2 & 4 \end{bmatrix}$ find the value of x. (3 marks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

12. The first term of an arithmetic sequence is -7 and the common difference is 3.
    a) List the first six terms of the sequence; (1 mark)

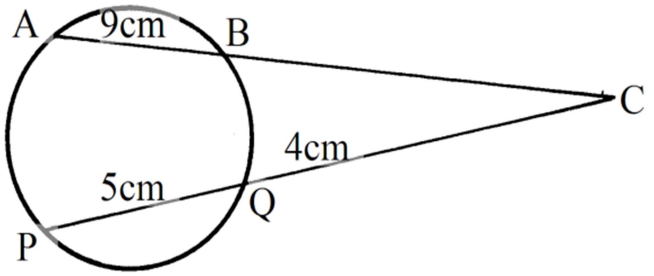
    b) Determine the sum of the first 50 terms of the sequence. (2 marks)

13. Pipe A can fill an empty water tank in 3 hours while pipe B can fill the same tank in 5 hours. When the tank it can be emptied by pipe C in 15 hours. Pipe A and B are opened at the same time when the tank is empty. If one hour later pipe C is also opened. Find the total time taken to fill the tank.
    (4 marks).

14. Make t the subject of the formula (3 Marks)
    $$\frac{r}{\sqrt{P^2-t^2}} = \frac{P}{t}$$

15. The figure below shows a circle centre O. AB and PQ are chords intersecting externally at a point C. AB = 9cm, PQ= 5cm and QC = 4cm. Find the length of BC. (3marks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com



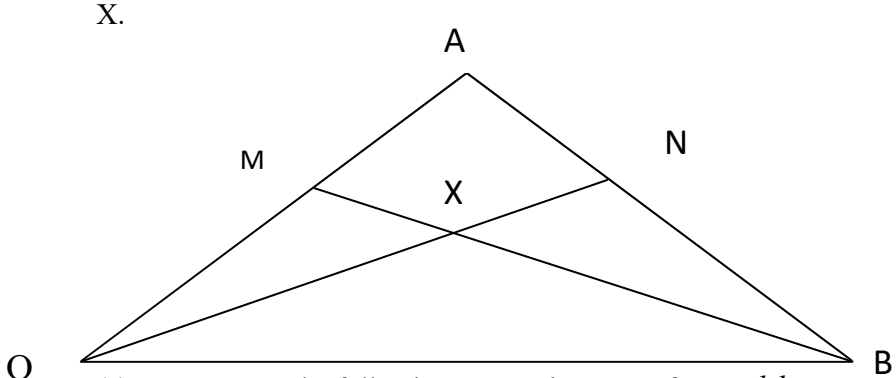
16. Using table of reciprocals of numbers, find the value of x if (3 Marks)

$x = \frac{1}{25.36} + \frac{3}{1.302}$

SECTION II (50mks)

Answer only *five* questions in this section in the spaces provided.

17. OAB is a triangle in which $OA = a$ *and* $OB = b$. M is a point on OA such that OM: MA = 2: 3 and N is another point on AB such that AN: NB = 1: 2. Lines ON and MB intercept at X.



(a) Express the following vectors in terms of a *and* b.

(i) $\underset{\sim}{AB}$ (1 mark)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

(ii) $\underset{\sim}{ON}$ (2 marks)

x	-4	-3	-2	-1	0	1	2	3
x^3	-64							27
$2x^2$								
$-5x$								
-8								
y	-20							

(1 mark)

(iii) $\underset{\sim}{B}\underset{\sim}{M}$

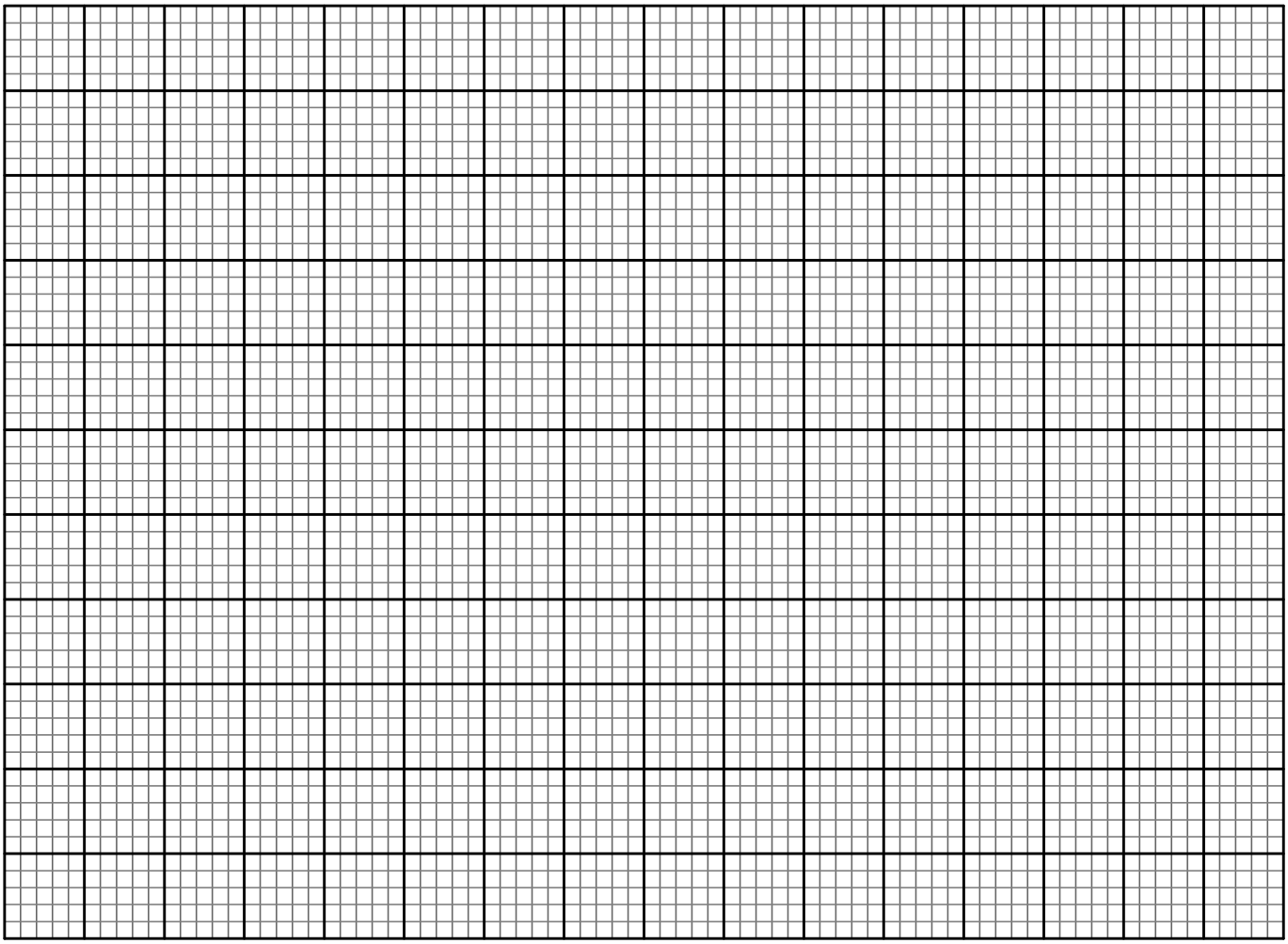
(b) If $\underset{\sim}{OX} = k\underset{\sim}{ON}$ and $\underset{\sim}{BX} = h\underset{\sim}{BM}$ express **OX** in two different ways. Hence or otherwise find the values of h and k. (5 marks)

(c) Determine the ratio OX: XN. (1 mark)

18. Draw the graph of $y = x^3 + 2x^2 - 5x - 8$ for values of x in the range $-4 \leq x \leq 3$

(5 marks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com



By drawing suitable straight line on the same axis, solve the equations.

i) $x^3 + 2x^2 - 5x - 8 = 0$ (1 mark)

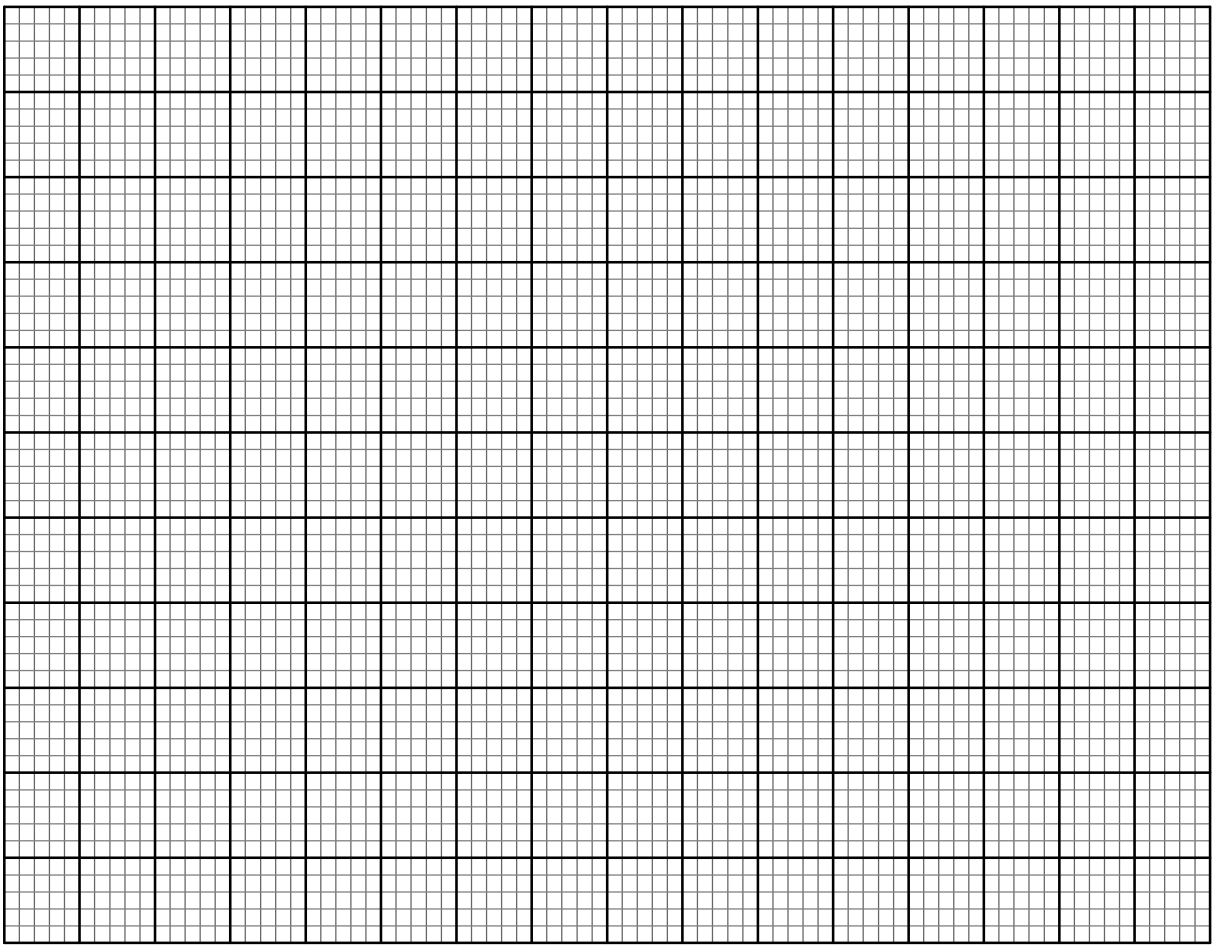
ii) $x^3 + 2x^2 - 5x - 7 = 0$ (2 marks)

iii) $3 + 3x - 2x^2 - x^3 = 0$ (2 marks)

19. A transformation represents by the matrix $\begin{pmatrix} 2 & 0 \\ 0 & 2 \end{pmatrix}$ maps A(1, 3), B(3, 3) and C(2, 1) onto $A^1B^1$and C^1 respectively.

a) On the grid provided, draw the triangle ABC and its image $A^1B^1C^1$ on the same axes. (3 marks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com



b) Hence or otherwise determine the area of the triangle $A^1B^1C^1$ (2 marks)

c) Another transformation represented by the matrix $\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$ maps $A^1B^1C^1$ onto $A^{11}B^{11}C^{11}$.Plot triangle $A^{11}B^{11}C^{11}$ on the same axes. (2 marks)

d) Describe the transformation represented by the matrix $\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$ (1 mark)

e) Determine the matrix of the single transformation which maps $A^{11}B^{11}C^{11}$ onto ABC. (2 marks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

20. An examination involves a written and a practical test. The probability that a candidate passes the written test is $\frac{6}{11}$. If a candidate passes a written test then the probability of passing the practical test is $\frac{3}{5}$, other wise it would be $\frac{2}{7}$.

(a) Illustrate this information on a tree diagram (2 marks)

(b) Determine the probability that a candidate

(i) Passes both tests (2 marks)

(ii) Passes the written test only (2 marks)

(iii) passes the practical test only (2 marks)

(iv) Fails all test (2 marks)

21. Three partners Mutua, Muthoka and Mwikali contributed Sh. 600,000, Sh. 400,000 and Sh. 800,000 respectively to start a business of a matatu plying Mbumbuni – Machakos route. The matatu carries 14 passengers with each paying Sh. 250. The matatu makes two round trips each day and ever full. Each day Sh. 6000 is used to cover running costs and wages.

a) Calculate their net profit per day. (2 marks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

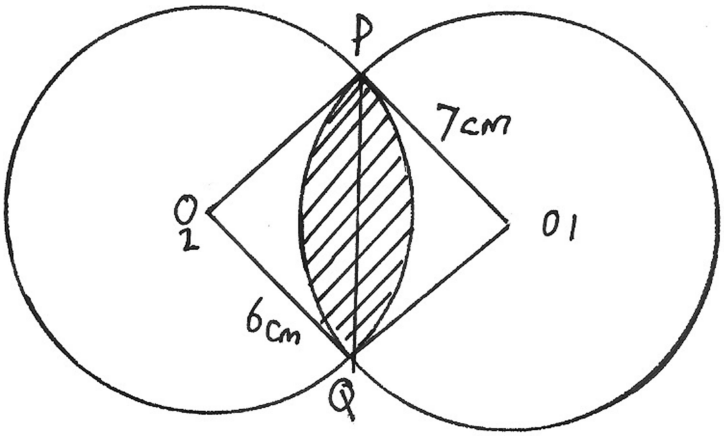
b) The matatu works for 25 days per month and is serviced every month at a cost of KSh.10, 000. Calculate their monthly profit in June. (1 mark)

c) The three partners agreed to share 40% of the profit equally and 60% to be shared in the ratio of their contribution. Calculate Muthoka's share in the month of July (4 marks)

d) The matatu developed mechanical problems and they decided to sell it through an agent who charged a commission of 5% on selling price. Each partner received Ksh. 475,000 from the agent after he had taken his commission. Determine the price at which the agent sold the matatu.
(3 marks)

22. Two circles with centres O_1 and O_2, have radii 7cm and 6cm respectively. The two circles intersect at P and Q and the length of the common chord PQ is 10cm.

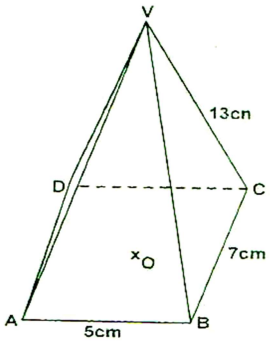
Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com



Calculate the area of the shaded region in the above diagram to 4 significant figures.

(10 marks)

23. The figure below is a right rectangular based pyramid VABCD where AB = 5cm, BC = 7cm, VC = 13cm and O is a point on the base of the pyramid vertically below V.



Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

Calculate

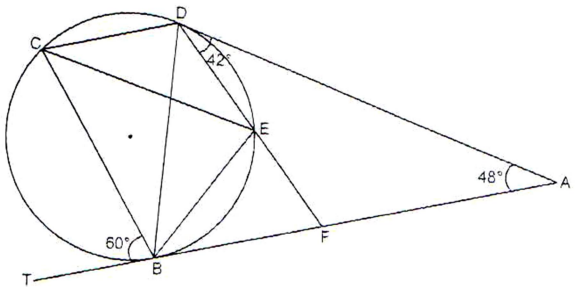
(a) AC (2 Marks)

(b) VO, the height of the pyramid. (2 Marks)

(c) the angle between the edge VB and the plane ABCD. (3 Marks)

(d) the angle between the planes VBC and ABCD. (3 Marks)

24. In the figure below, AT and AD are tangents to the circle at B and D respectively. DEF is a straight line, $< CBT = 60^0$, < FAD = 48^0 and < ADF = 42^0



Calculate giving reasons, the value of:

a) < DCE (2 marks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

b) <BCE (2 marks)

c) <DCB (2 marks)

d) <DEC (2 marks)

e) <BEF (2 marks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

BRILLIANT EDUCATIONS

BRILLIANT PUBLISHERS
Tel: +254711-410-583
The Sign of Knowledge

Tr. Stephen O. Oketch

Name……. ADM No…….. Class……

Candidates Signature…… Date…….

231/1

TRIAL II

BIOLOGY

BRILLIANT PUBLISHERS PRE-MOCK 2020

Paper 1

(THEORY)

TIME 2 HOURS

INSTRUCTIONS TO CANDIDATES

- Write your name and Index Number in the spaces provided above.
- Sign and write date of examination in the spaces provided above.
- Answer **ALL** questions in the spaces provided.

FOR EXAMINER'S USE ONLY

Question	Maximum score	Candidate's score
1-30	80	

Candidates should check the question paper to ensure that all the 10 pages are printed as indicated and no questions are missing.

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

1. Name the branch of Biology that involves the study of: **(2marks)**

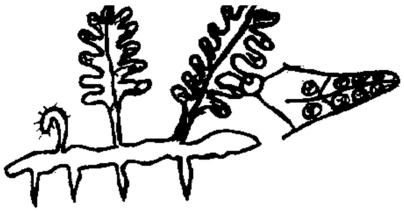
a) Organisms for the sake of classifying them.

.....

b) Microscopic organisms.

……

2. The diagram below represents a plant



a) Name the division to which the plant belongs. **(1mark)**

……..……..

b) Give **three** reasons for your answer in (a) above. **(3marks)**

…….…….

……..…..…….

……..…..…….

3. State **three** parameters that can be used to estimate growth in seedlings. **(3marks)**

…….…….

……..…..…….

……..…..…….

4. Equal amounts of crushed Irish potato were placed in equal volumes of hydrogen peroxide solution at indicated pH. The volume of the gas produced was measured and recorded as shown in the table below.

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

pH	4.0	7.0	9.0
Volume of gas (cm^3)	2.7	5.7	7.7

(a) Name the gas that was produced. **(1mark)**

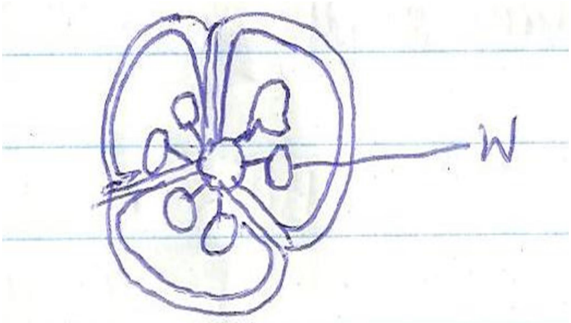
……..

(b) Account for the difference in the volume of the gas produced in pH 4.0 and pH 9.0 **(2marks)**

…….

……..

5. The diagram below represents a transverse section of an ovary from a certain flower.



(i) Name the structure labeled W. **(1mk)**

……

(i) Name the type of placentation illustrated in this diagram. **(1mk)**

……

6. What are the names of modified leaves enclosing bougainvillea flowers whose function is to attractinsect pollinators? **(1mark)**

……..

7. **(a)** A dog weighing 15.2kg requires 216kJ while a mouse weighing 50g requires 2736 kJ per day.

Explain. **(2marks)**

……..

……...

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

(b) Under what condition is lactic acid formed in human muscles? **(1mark)**

……

……

……

8. In a certain experiment, the following observation was made:

When red blood cell was placed in a certain solution, the solution exerted more osmotic pressure leading to the cell losing water molecules to become crenated/ shrunk.

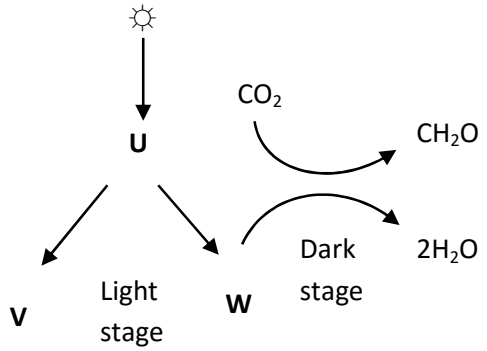
(a) What type of solution was the cell placed in respect to the cell's cytoplasm**?** **(1 mark)**

……..

(b) By which physiological process did the cell lose water molecules? **(1 mark)**

……

9. Study the flow diagram below.



Name the substance **U**, **V** and **W**. **(3 marks)**

U:……

V:……

W:……..

10 a) State the deficiency diseases of each of the following vitamins. **(3 marks)**

(i) B_1 …….

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

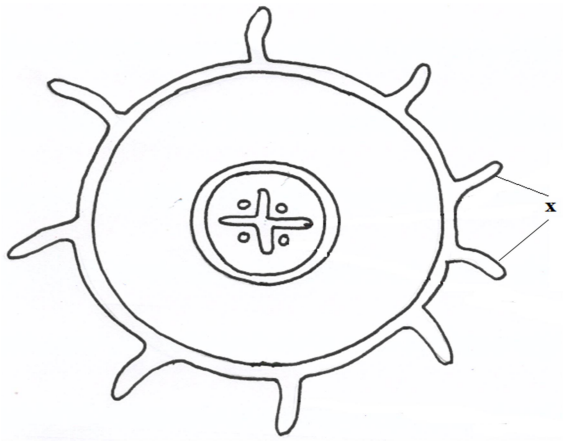
(ii) B_2 …….

(iii) B_6 ……

(b) What is the role of roughage in a diet? **(1 mark)**

……

11. The diagram below represents a transverse section of a plant part. Study it and answer the questions that follow.



a) Name the class in which the plant belongs. **(1mark)**

……..…

……

b) Give a reason for answer (a) above **(1mark)**

…….

……

……

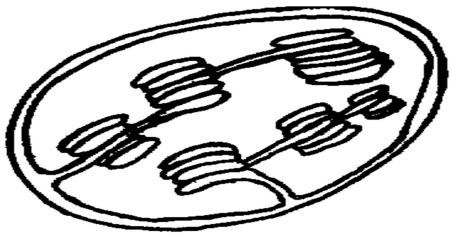
c) State **one** adaptation for the structures labeled X to their functions. **(1mark)**

……

…..……

……

12. Below is a diagram of an organelle.



Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

(a) State the function of the organelle drawn above. **(1mark)**

……..

(b) Name the parts of the organelle where :

(i) Oxygen gas is produced as a byproduct. **(1mark)**

……..……

(ii) Carbon (IV) oxide is utilized.

(1mark)

……..

13. The equation below represents a metabolic process that occurs in the mammalian liver.

Amino Acids ⟶ Organic + Urea Compounds

(a) Name the process **(1 mark)**

……

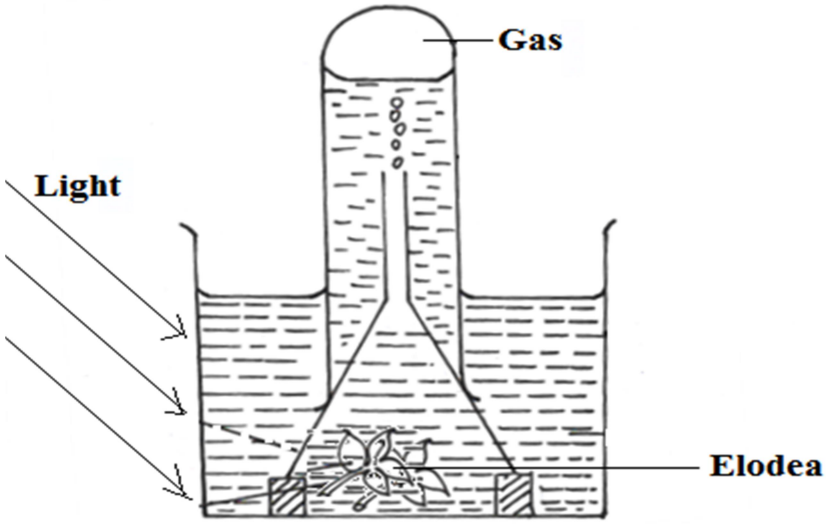
……

(b) What is the importance of the process to the mammal? **(2marks)**

……..……

……

14. The diagram below represents a set up that was used to investigate a certain process in a plant.



(a) State the process that was being investigated. **(1 mark)**

……

……

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

(b) Other than the factors shown, state two factors that would affect the process named in (a) above. **(2 marks)**

……..……

……

15. a) Name the causal organism for amoebic dysentery. **(1 mark)**

……

……

b) State three preventive measures of schistosomiasis in human beings **(3 marks)**

……

……

16. (a) Why is the wall of the left ventricle thicker than that of the right ventricle. **(1mark)**

……

……

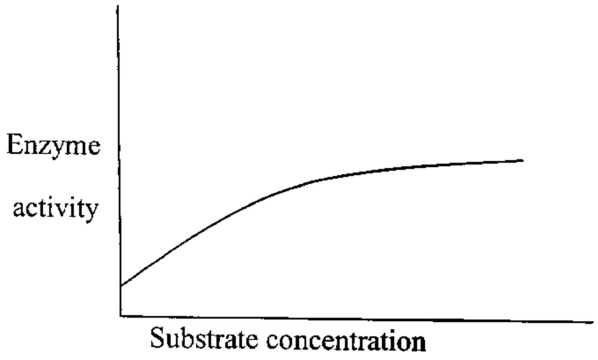
(b) State **three** adaptations of xylem to water transportation **(3marks)**

……

……

……

17. Use the graph below to answer the following questions.



(a) Why does the activity of the enzyme become constant after a while? **(1mark)**

……

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

……

(b) State how the activity of the enzyme may be increased in (a) above. **(1mark)**

……

……

18. Describe capture - recapture method of estimating population. **(3marks)**

……

……

……

……

19. What is meant by self sterility with reference to flowers? **(1mark)**

……

……

20. Why do plants lack complex excretory system? **(3marks)**

……

……

……

21. State **three** advantages of asexual reproduction in plants. **(3 marks)**

……

……

……

……

22. How does sunken stomata help in lowering transpiration? **(3marks)**

……

……

……

……

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

23. State the importance of active transport in living organisms. **(3marks)**

……

……

……

24. Why does carboxyhaemoglobin lead to death? **(2marks)**

……

……

25. Name **two** gaseous exchange sites in higher plants. **(2marks)**

……

……

26. What causes apical dominance? **(1mark)**

……

……

27a) What type of circulatory system is found in members of class insecta? **(1 mark)**

……

……

……

b) Name the blood vessel that transports blood from:

(i) Small intestine to liver. **(1 mark)**

……

ii) Lungs to heart **(1 mark)**

……

28. Distinguish between natural and acquired immunity. **(2 marks)**

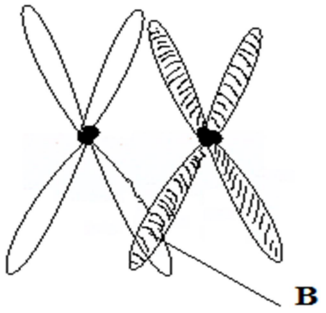
Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

……

…...……

……

29. The diagram below shows a phenomenon which occurs during cell division.



a) Identify the stage of cell division in which this phenomenon occurs. **(1 mark)**

…….

……..…

b) State the importance of the phenomenon taking place in the part labeled B. **(2 marks)**

……..……

……

……

30. State **two** functions of ovaries in humans. **(2marks)**

……..

……...…...……

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

BRILLIANT PUBLISHERS
Tel: +254711-410-583
The Sign of Knowledge
Jr. Stephen O. Oketch

NAME……INDEX NO……

CANDIDATE'S SIGN……DATE…….

SCHOOL……

231/2

TRIAL II

BRILLIANT PUBLISHERS PRE-MOCK 2020

BIOLOGY
PAPER 2
THEORY
MARCH/APRIL 2020
TIME: 2 HOURS

Kenya Certificate of Secondary Education (K.C.S.E)

INSTRUCTIONS TO CANDIDATES.

1) Write **your name** and **index number** in the spaces provided above.
2) Sign and write the date of examination in the spaces provided above.
3) This paper consists of section **A** and **B**.
4) Answer **ALL** questions in section A in the spaces provided above.
5) In section **B** answer questions **6 (compulsory)** and either question **7** or **8** in the spaces provided after question **8.**

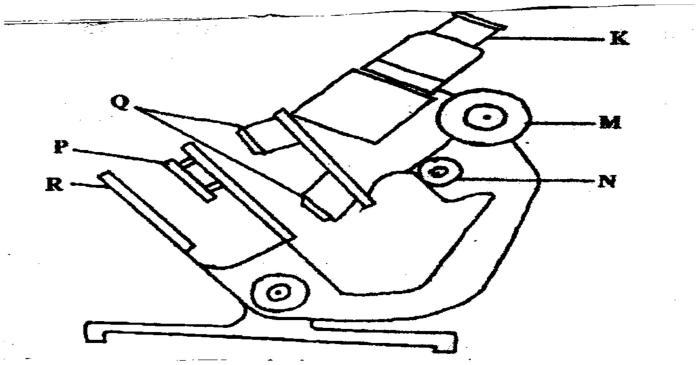
FOR EXAMINERS' USE ONLY.

SECTION	QUESTIONS	MAXIMUM SCORE	CANDIDATES SCORE
A	1	8	
	2	8	
	3	8	
	4	8	
	5	8	
B	6	20	
	7	20	
	8	20	
	TOTAL	80	

This paper consists of 8 printed pages.
Candidates should check the question paper to ascertain that all pages are printed as indicated and no questions are missing.

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

1. The diagram below shows some components of a light microscope.



a), Name the 1mks
K –
M –

b), State the functions of 2mks
P –
Q –

c) A student was viewing a prepared slide of a plant cell under high power microscope. The features of the cell were blurred. Which one of the labeled parts of the microscope would the student use to obtain;-

(i), A sharper outline of the features 1mk

ii), Give the formula used to calculate magnification in a light microscope 1mk

d), A student was preparing a section of a plant cell to be viewed on a light microscope. Give a reason for each of the following steps.

i), Cutting a very thin section 1mk

ii), staining the section 1mk

iii), Putting the section in water. 1mk

2. Haemophilia is a sex linked disorder due to a recessive gene. A carrier woman married a normal man. Let **H** represent gene for normal condition and **h** to represent gene for haemophilic condition.

a), State the genotypes of

i), Man 1mk

ii), woman 1mk

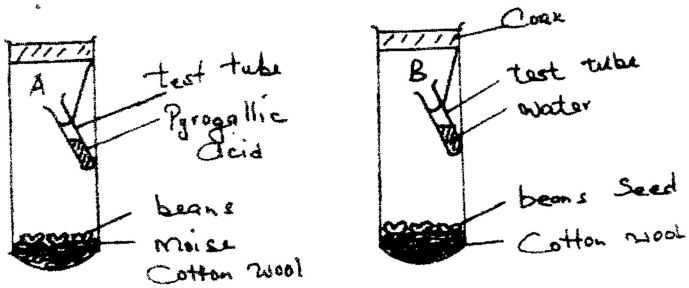
bi), Using a punnet square, show the genotypes of the children resulting from this marriage 3mks

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

ii), State the probability of getting a carrier daughter. 1mk

c), Give an explanation why haemophilia is more common in males than in females. 2mks

3. In an experiment a group of students set up the test tubes as shown below



a), What was the aim experiment? 1mk

b), Why was pyrogallic acid included in the gas jar. **A**? 1mk

c), What results would you expect in each of the gas jar **A** and **B** at the end of experiment? 2mks

d), State two artificial ways of breaking seed dormancy. 2mks

e), Name two harmones that bring about rapid cell division in plants 2mks

4. a. i), Distinguish between single circulatory system and closed circulatory system. 2mks

ii), Name the blood vessels that transports blood from

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

a), small intestines to the liver 1mk

b), Lungs to the heart 1mk

bi), Name one defect of circulatory system in humans. 1mk

ii), State three functions of blood other than transport. 3mks

5. An experiment was set up to demonstrate the necessity of carbon (IV) oxide for photosynthesis in a certain green plant as shown below. The plant was first kept darkness for 48 hours before the experiment.



a), Why was the plant kept in darkness for 48 hours before the start of this experiment. 1mk

b), What was the role of sodium hydroxide? 1mk

ci), What happened to the leaf in the flask when it was tested for presence of starch after the set up was exposed to light for a day?. 1mk

ii), Give reasons for your answer in (c) I above 2mks

d. Suggest a control for this experiment. 1mk

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

e), Name other two limiting factors in this experiment. 2mks

SECTION B **40MKS**

Answer question 6 (Compulsory) and either question 7 or 8 in the spaces provided after question 8.

6. A certain experiment was performed to demonstrate the effect of sweating on human body temperature. Boiling tubes **A** and **B** were filled each with water their initial temperatures recorded. This was repeated after every 5 minutes. The surface of tube **A** was continuously wiped with a piece of cotton wool which had been soaked in methylated spirit. The results are as shown below

Time (min)	**Temperature 0^c in tube**	
	A	**B**
0	80	80
5	54	67
10	40	59
15	29	52
20	21	47
25	18	46

a), On the same axis, plot graphs of water temperature against time (min) 8mks



Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

b), Find the rate of cooling in **A** 1mk

c), Why was test **B** included in the set up? 1mk

d), Name two ways through which heat is lost in tube **B**. 2mks

e), State the expected results if tube **A** was insulated. 1mks

f), Name the structures in the following organisms that would insulate heat loss.

i), Birds 1mk

ii) Mammals 1mk

g), Name any two receptor cells on the skin of man. 2mks

h), Describe the response of hair on the skin during cold weather. 3mks

7. a) Describe gaseous exchange in alveolus. 8mks

b) Describe the process of exhalation in mammals. 8mks

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

c) Discuss the characteristics of gaseous exchange sites in an animal. 4mks

8. Discuss the nitrogen cycle.

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

BRILLIANT EDUCATIONS

BRILLIANT PUBLISHERS
Tel: +254711-410-583
The Sign of Knowledge

Tr. Stephen O. Oketch

NAME ……INDEX NO……
CANDIDATE'S SIGNATURE……

232/1
PHYSICS PAPER 1 **Date……**
2HOURS

MARCH/APRIL 2020

TRIAL II

BRILLIANT PUBLISHERS PRE-MOCK 2020

Kenya certificate of secondary Education K.C.S.E.

Write your name and index numbers in the spaces provided above.
This paper consists of TWO sections: A and B
Answer All the questions in section A and B in the spaces provided
ALL working MUST be clearly shown
Mathematical tables and electronic calculators may be used.

For examiners use only

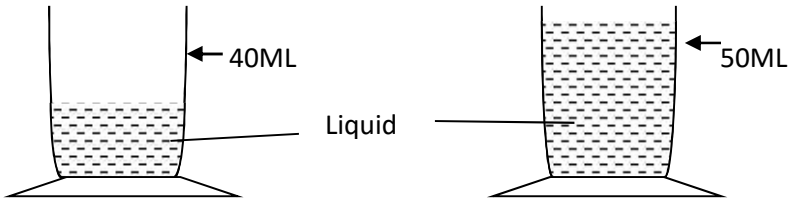
Section	question	Maximum score	Candidate's score
A	1-14	25	
B	1516	13	
	16	12	
	17	12	
	18	18	
	Total Score	**80**	

This paper consists of 11 pages
Candidates should check the question paper to ensure that all pages are printed as indicated and no questions are missing.

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

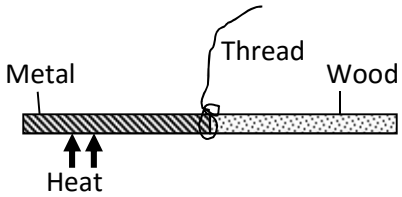
SECTION A: 25 MARKS

1. A stone of mass 40g was completely immersed in a liquid. The level of liquid are shown in the figure



Determine the density of the stone in SI units (2mks)

2. The following figure shows a rod made of wood on one end and metal on the other end suspended freely with a piece of thread so that it is in equilibrium.



The side made of metal is now heated with a Bunsen flame. State with a reason, the side to which the rod is likely to tilt (2mks)

……

……

…….

3. Estimate the size of an oil molecule if a drop of oil of volume 6.0×10^{-10} m^3 forms a patch of 32 on a water surface. (2mks)

4. Other than oil patch being monolayer, sate any one other assumption in the oil drop experiment. (1mk)

……

……

…….

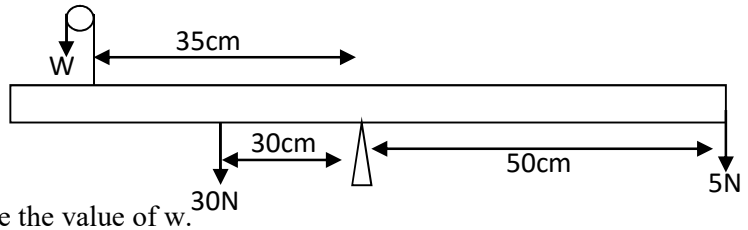
5. An immersion heater rated at 180W is placed in a liquid of mass 2kg. When the heater is switched on for 7.5 minutes the temperature of the liquid rises by 400C. Determine the specific heat capacity of the liquid. (3mks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

6. Other than temperature state one other factor that affects the surface tension of water. (1mk)

……
……

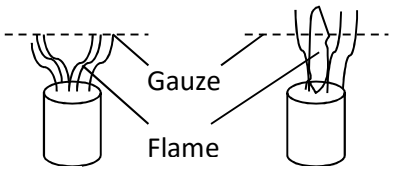
7. The figure below shows a uniform bar pivoted at its centre and is at equilibrium.



Determine the value of w. (3mks)

8. When a Bunsen burner is lit below wire gauze, it is noted the flame initially burns below he gauze as shown in

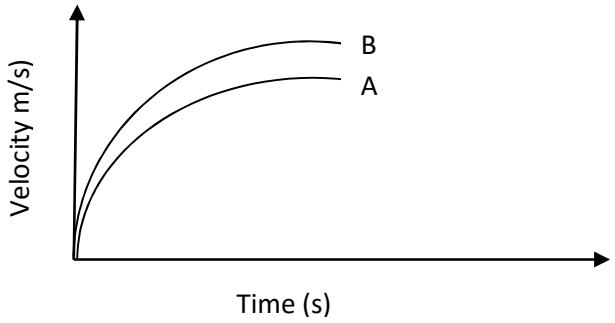
(i) After sometime, the flame burns below as well as above the gauze as shown in



(ii) Expl i this observation ii (2mks)

……
……
……
……

9. The figure shows the velocity time graph of two identical spheres released from the surfaces of two liquids A and B.



Give a reason why the terminal velocity of the sphere In B is higher than in A. (1mk)

……
……

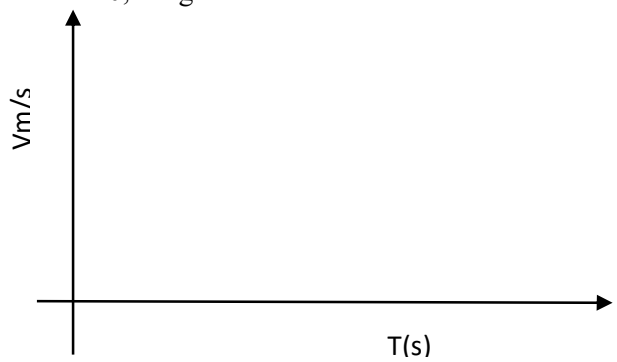
10. A box of mass 500g is dragged along a level ground at a speed of 12m/s. if the force of friction between the box and the floor is 2000N, calculate the power developed. (2mks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

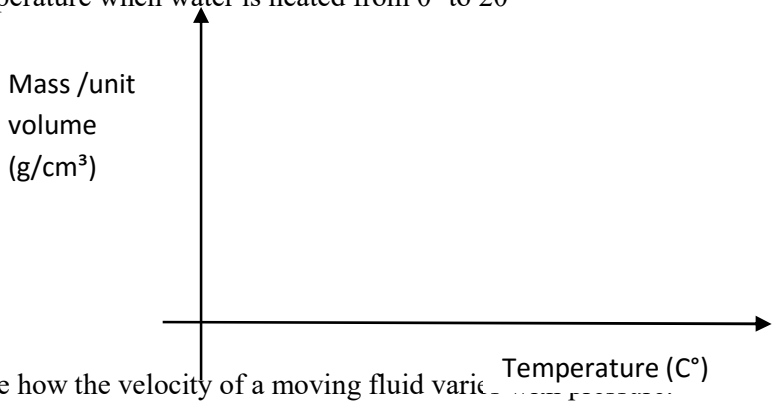
11. State how heat losses by convection and radiation are minimized in a thermos flask. (2mks)

……
……
……

12. On the axes provided sketch a graph of velocity (v) verses time (t) for uniformly accelerated motion given that t=0,v is greater than zero. (1mk)



13. Sketch on he axes provided a graph to show how mass per unit volume of water varies with temperature when water is heated from 0^0 to 20^0 (2mks)



14. State how the velocity of a moving fluid varie… (1mk)

……
……
……

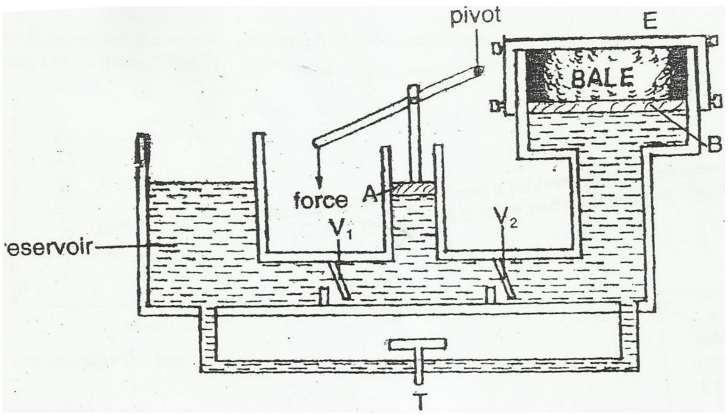
Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

SECTION B (55 MARKS)

15. (a) When a fountain pen is taken in a high aero plane, it leaks. A ball point pen does not have this problem. Explain how the ball point is able to overcome this problem. (1mk)

……
……
……

(b) The fig below shows a hydraulic press used to compress a bale



(i) Explain briefly ho a force applied on the lever compresses the bale. (4mks)

……
……
……
……
……

(ii) Given that the area of piston B is $18cm^2$ and that of piston A $3.0cm^3$. A force of 2N is applied to piston A, find the force produced on the larger piston B that compresses the bale. (2mks)

(c) A 180W heater is immersed in a copper calorimeter of mass 100g containing 200g of alcohol. When he heater is switched on after 36 seconds the temperature of calorimeter and its contents rises t 12^{0}. If S.H.C of water and copper is 4200 J/kgk and 400j/Kgk respectively.
Determine:

(i) Heat lost by the heater (2mks)

(ii) Heat gained by calorimeter and alcohol, if the specific heat capacity of alcohol C_u. (2mks)

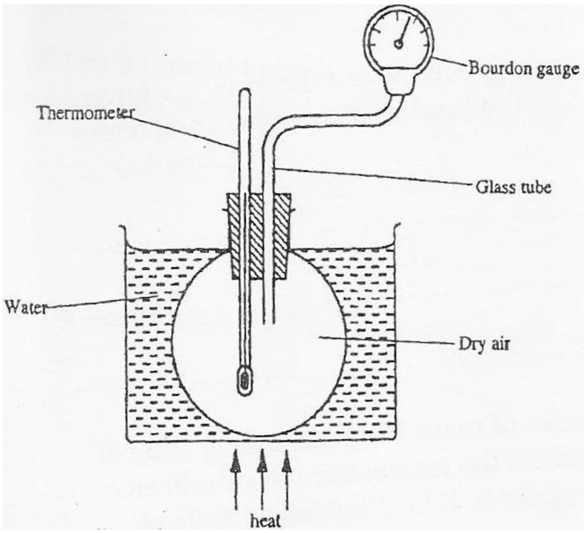
(iii) The value of specific heat capacity of alcohol (1mk)

16. (a) State the pressure law for an ideal gas (1mk)

……
……
……

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

(b) The set up shows an arrangement to determine the relationship between temperature and pressure of a gas constant volume.



(i) Describe how pressure measurements are obtained in the experiment. (3mks)

……

……

……

……

(ii) Explain how the result form the experiment can be used to determine the relationship between temperature and pressure. (2mks)

……

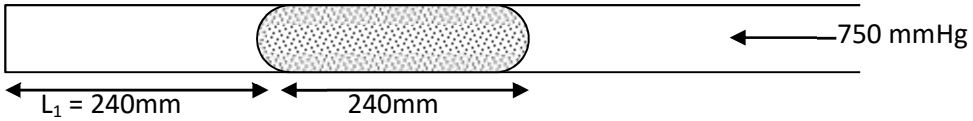
……

……

……

(c) A bicycle tire is pumped to a pressure of 2.2×10^5pa at23^0C. After a race the pressure is found to be 2.6×10^0 pa. Assuming the volume of the tire did not change, what is the temperature of the air in the tire. (3mks)

(d) Air is trapped inside a glass tube by a thread of mercury 240 mm long. When the tube is held horizontally the length of the air column is 240mm.



Assuming that the atmospheric pressure is 750mm Hg and the temperature is constant; calculate the length of the air column when the tube is vertical with open end down. (3mks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

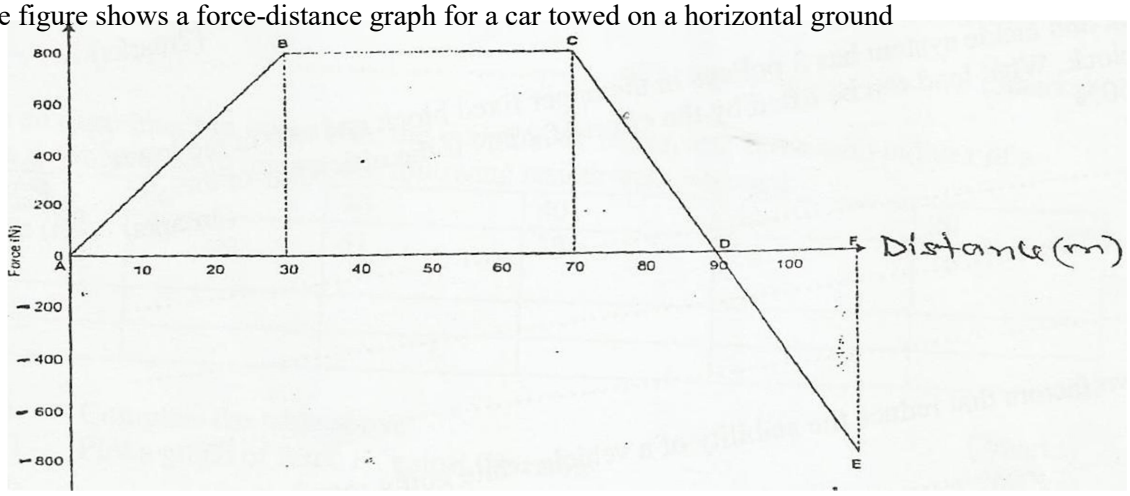
17. (a) Define the term work (1mk)

……

……

……

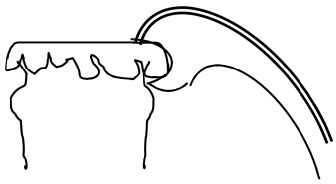
(b) The figure shows a force-distance graph for a car towed on a horizontal ground



(i) Calculate the total work done (3mks)

(ii) If the velocity just before reaching point C is 0.6m/s, calculate the power developed by the agent providing the force at this point. (3mks)

(c) The figure below shows a bottle top opener



Indicate on the diagram the direction of the load and effort. (2mks)

(d) A block and tackle system has 3 pulleys in the upper fixed block and two in the lower movable block. What load can be lifted by the effort of 200N if the efficiency of the system is 60%

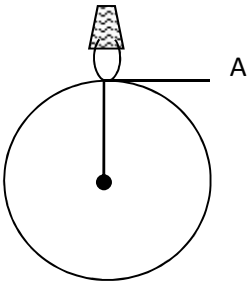
(3mks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

18. (a) State two factors that reduce the stability of a vehicle while going round a banked bend.
(2mks)

……
……
……

(b) The figure shows a bucket filled with water of mass 5kg tied on a string 2.0 m long being rotated in a vertical circle with a constant speed V m/s.



Calculate the minimum speed the bucket takes to rotate in position A so that the water remains in the bucket. (3mks)

(c) A car of mass 6000kg is driven round a horizontal curve of radius 250m. if the force of friction between the tyres and the road is 21000N, what is the maximum speed that the car can be driven at on the curve without going off the road. (3mks)

(d) In an experiment to investigate the variation of centripetal force with radius r of a circle in which a body rotates, the following results were obtained.

Mass(g)	60	50	40	30	20
Radius® cm	50	41	33	24	16
F(N)					
R(m)					

(i) Complete the table above (2mks)

(ii) Plot a graph of force F against the radius (5mks)

(iii) Given that mass of the body is 100g, use the graph to determine the angular velocity. (3mks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

(e) State one application of circular motion (1mk)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

BRILLIANT EDUCATIONS

BRILLIANT PUBLISHERS
Tel: +254711-410-583
The Sign of Knowledge

Tr. Stephen O. Oketch

NAME:……INDEX NO:……

SCHOOL:……CANDIDATE'S

SIGNATURE:…….

DATE:…….

232/2

PHYSICS (THEORY) **TRIAL II**

PAPER 2 **BRILLIANT PUBLISHERS PRE-MOCK 2020**

MARCH/APRIL 2020

TIME: 2 HOURS

Kenya Certificate of Secondary Education (K.C.S.E)

INSTRUCTIONS TO CANDIDATES:

1. Write your name, school, admission number and index number is the spaces provided above.

2. Sign and write the date of examination in the spaces above.

*3. Answer **ALL** the questions in section A and B in the spaces provided.*

*4. All working **MUST** be clearly shown.*

5. Non-programmable silent electronic calculators and KNEC mathematical tables may be used.

6. This paper consists of 15 pages.

7. Candidates should check the question paper to ascertain that ALL the pages are printed and that no questions are missing.

This paper consists of 12 printed pages. Candidates should check to ascertain that all pages are printed as indicated and that no questions are missing.

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

SECTION A: (25 MARKS)

*Answer **ALL** questions this section in the spaces provided.*

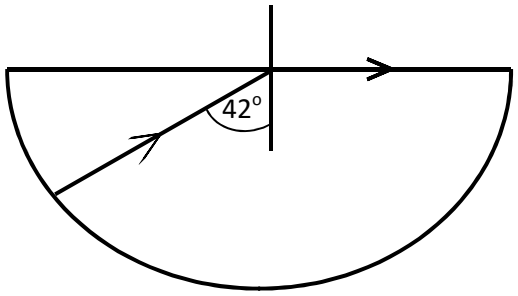
1. What property of light is suggested by the formation of shadows? (1mark)

2. Why are audio recording hall walls covered with soft materials. (1mark)

3. A highly negatively charged rod is gradually brought close to the cap of a positively charged electroscope. It is observed that the leaf collapses initially and then diverges. Explain this observation. (3marks)

4. The figure **below** shows a ray of light incident on a face of semicircular prism.

   Determine the refractive index of the glass prism. (3marks)



Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

5. Explain why repulsion is the only sure test for polarity of a magnet. (1mark)

6. State the use of manganese (IV) oxide in a dry cell. (1mark)

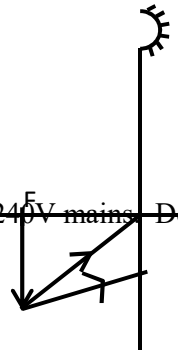
7. A lamp of height 6cm stands in front of pin-hole camera at a distance of 24cm from the pin-hole. The camera screen is 8cm from the pinhole. Calculate the height of the image formed on the screen. (3marks)

8. A car accumulator is rated 40Al and is expected to supply a constant current for 120 minutes. Calculate the amount of current delivered. (2marks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

9. The figure **below** shows two incident rays on a concave mirror from the top of an object.

   Complete the ray diagram showing the reflected rays. (2marks)



10. An electric bulb rated 40W is operated on 240V mains. Determine the resistance of its filament. (3marks)

11. The force on a straight conductor carrying current in a magnetic field can be varied by changing, among others, the magnitude of the current and the magnetic field strength. Name the other factors that can be changed to vary the force. (2marks)

12. (i) Distinguish between transverse and longitudinal waves. (1mark)

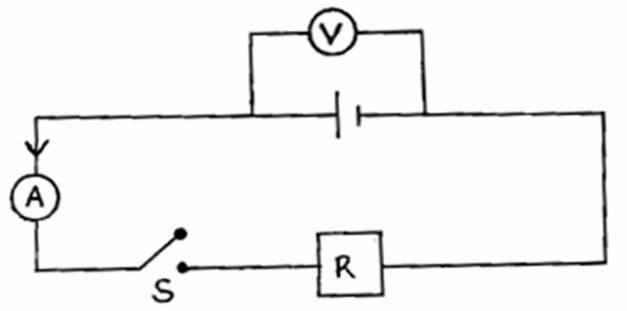
    (ii) Give **one** example of a transverse wave and one example of a longitudinal wave. (2marks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

SECTION B: (55 MARKS)

*Answer **ALL** questions this section in the spaces provided.*

13. (a) In an experiment to determine the internal resistance of a cell, the following circuit was used.



It was noted that when S is open, the voltmeter reads 1.5V and when S is closed the voltmeter reads 1.3V and ammeter reads 0.2A.

(i) What is the e.m.f of the cell. (1mark)

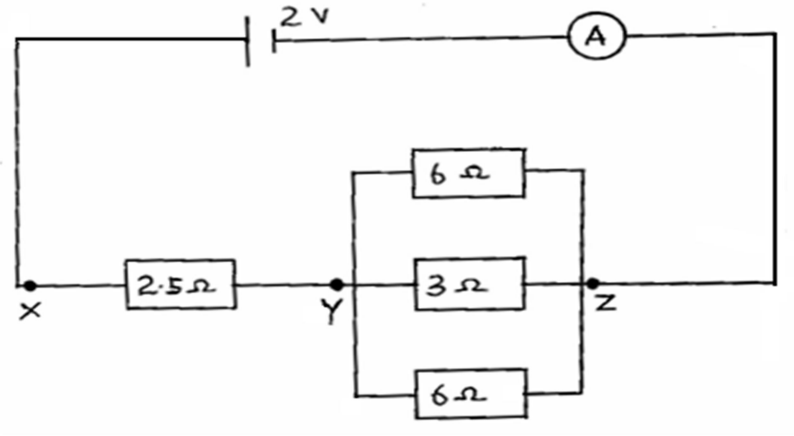
(ii) Determine the lost voltage. (1mark)

(iii) Find the value of R. (2marks)

(iv) Find the internal resistance of the cell. (2marks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

(b) Study the circuit **below** and answer the questions that follow.



(i) Determine the effective resistance of the circuit. (2marks)

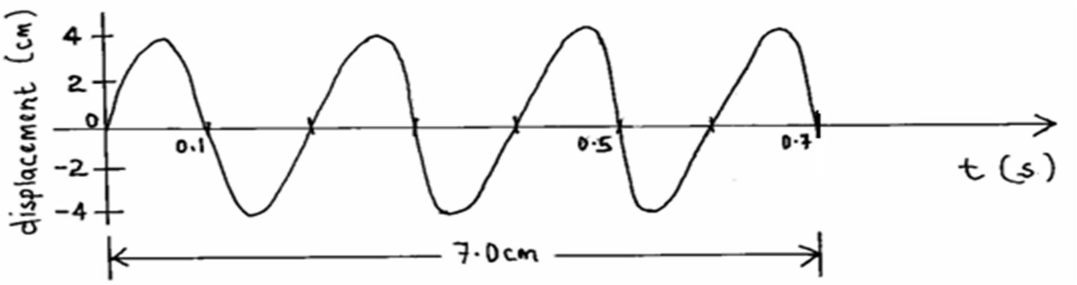
(ii) Find the ammeter reading. (2marks)

(iii) Find the p.d between X and Y. (2marks)

(iv) State the factors that affect the resistance of a conductor. (3marks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

14. The diagram **below** represents a wave motion.



(i) What is the amplitude of the wave in metres. (1mark)

(ii) How many cycles are made? (1mark)

(iii) Calculate the wavelength, λ, of the wave. (2marks)

(iv) Calculate the frequency of the wave. (2marks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

(v) Calculate the velocity of the wave. (2marks)

(b) (i) The echo sounder of a ship receives the reflected wave from a sea-bed after 0.2 seconds. What is the depth of the sea bed if the velocity of sound in water is 1450m/s. (3marks)

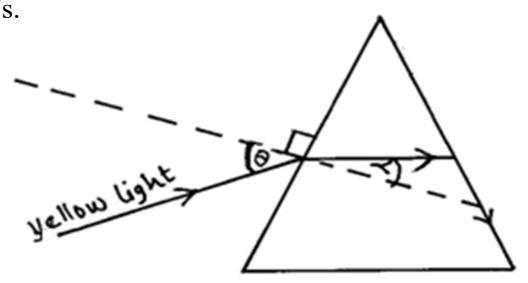
(ii) State **two** factors that affect the speed of sound in air. (2marks)

15. (a) State **two** conditions necessary for total internal reflection to occur. (2marks)

(b) Define the term critical angle as used in refraction of light. (1mark)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

(c) The figure **below** shows the path of a ray of light through a glass prism. The speed of yellow light in the prism is 1.88×10^8m/s.



(i) Determine the refractive index of the prism material for the light (speed of light in vacuum, $c = 3.0 \times 10^8$m/s. (3marks)

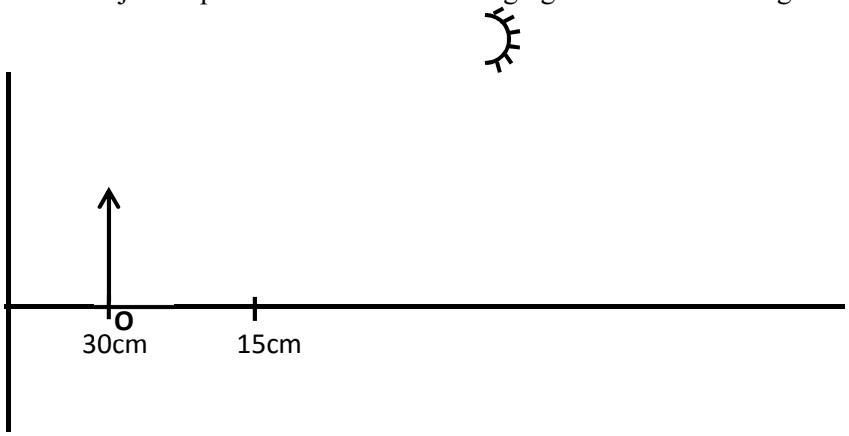
(ii) Show on the figure, the critical angle, c, and determine its value. (4marks)

(iii) Given that $r = 21.2^o$, determine the angle θ. (3marks)

16. (a) State the advantages of using a convex mirror as a driving mirror. (2marks)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

(b) The figure **below** shows an object **O** placed infront of a converging mirror of local length 15cm.

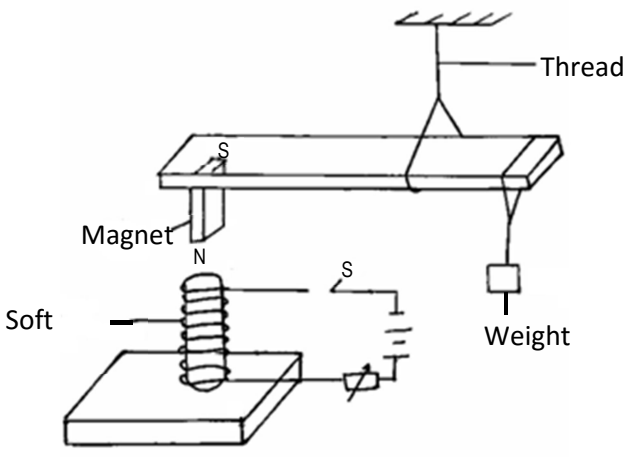


Draw on the figure a ray diagram to locate the image formed. (3marks)

(c) State why parabolic reflection is used in car headlights.

17. (a) State **three** factors that affect the strength of an electromagnet. (3marks)

(b) In the set up **below**, the suspended metre rule is in equilibrium balanced by the magnet and the weight shown. The iron core is fixed to the bench:



Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

(i) State and explain the effect on the metre rule when the switch S, is closed. (2marks)

(ii) What would be the effect of reversing the battery terminals? (1mark)

(c) The figure **below** shows two parallel current carrying conductors **A** and **B** placed close to each other. The direction of the current is into the plane of the paper.



On the same figure.

(i) Sketch the magnetic field pattern. (1mark)

(ii) Indicate the force F due to the current on each conductor. (1mark)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

BRILLIANT EDUCATIONS
BRILLIANT PUBLISHERS
Tel: +254711-410-583
The Sign of Knowledge
Tr. Stephen O. Oketch

Name……. Index No…….

Candidates Signature……

Date ……

233/1
CHEMISTRY
Paper 1
2 Hours

BRILLIANT PUBLISHERS PRE-MOCK 2020

Kenya Certificate of Secondary Education (K.C.S.E)

Instructions to candidates

(a)Write your name and index number in the spaces provided above.

(b) Sign and write the date of examination in the spaces provided above

(c) Answer **ALL** the questions in the spaces provided in the question paper

(d) KNEC Mathematical tables and electronic calculators may be used for calculations

(e) All working **MUST** be clearly shown where necessary

(f) This paper consists of 13 printed pages

(g) Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing

(h) Candidates should answer the questions in English

FOR EXAMINER'S ONLY

QUESTION	MAXIMUM SCORE	CANDIDATES SCORE
1-29	80	

Turn over.

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

1 . Gas X was found to decolorize moist litmus paper. A colorless solution of potassium Bromide turned red-brown when gas X was passed through it.

a) What is observed when gas x is passed through potassium iodide solution**.** **(1mark)**

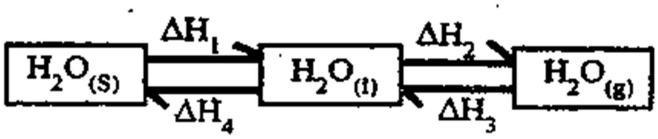
……

b) Write an equation to accompany the observation in (a) above. **(1 mark)**

……
……

2. An organic compound J has the following percentage by mass, carbon, 64.86%, hydrogen, 13.51% and the rest oxygen. The relative molecular mass of the compound is 74. Work out the molecular formula of compound J. [C=12. H=1 O=16] **(3 marks)**

3. The scheme below shows the energy changes that are involved between ice, water and steam. Study it then answer the questions that follow



(a) What name is given to the process represented by energy change ΔH_4? **(1 mark)**

……
….

(b) What is the sign of ΔH_3? Give a reason **(2 marks)**

……
……
…

4. A fixed mass of a gas has a volume of 250cm^3 at a temperature 27^{0}C and 750mmHg pressure. Calculate the volume the gas would occupy at 42^{0}C and 750mmHg pressure. (0^{0}C = 273K) **(3 marks)**

……
……
……
….

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

5. Complete the table below to show the number of the sub-atomic particles of the given nuclides. X and Y are not actual chemical symbols. **{3 marks}**

	Number of		
Particle	Protons	Neutrons	Electrons
$^{34}_{16}X^{-2}$			
$^{56}_{26}Y^{+3}$			

6. 100cm³ of 2M nitric acid reacted with 12.5g of a carbonate of metal M. (MCO_3) according to the following equation

$$2HNO_{3(g)} + MCO_{3(S)} \rightarrow M(NO_3)_{2(aq)} + CO_{2(g)} + H_2O_{(l)}$$

a) Calculate the number of moles of MCO_3 that reacted with nitric acid. **(2 marks)**

.....
.....
.....

b) Calculate the relative molecular mass of MCO_3 **(2 marks)**

……
……
……
……

7. (a) Name the substance formed when soap is used to wash in hard water **(1 mark)**

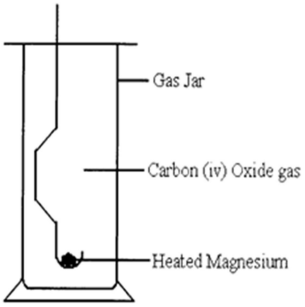
……
……
……
……

(b) Give one advantage of drinking hard water **(1 mark)**

……
……
……
……

8. The diagram below a heated magnesium metal lowered inside a gas jar of carbon (IV) oxide.

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com



Study it and answer the questions that follow.

(i) State **two** observations that can be made during and after the experiment **(2 marks)**

……
……
……
……

(ii) Write a balanced chemical equation for that reaction. **(1 mark)**

……
……
……

9. The $_pH$ values of some solutions labeled **E** to I are given in the table **below**. Use the information to answer the questions that follow.

$_pH$	14.0	1.0	8.0	6.5	7.0
Solution	E	F	G	H	I

(a) Identify the solution with the highest concentration of hydroxide ions **(1 mark)**

……
……

(b). Which solution can be used as a remedy for acid indigestion in the stomach? **(1 mark)**

……
……

(c) Which solution would react most vigorously with magnesium metal? **(1 mark)**

……
……
……

10. $120cm^3$ of nitrogen gas diffuses through a membrane in forty seconds. How long will it take $240cm^3$ of carbon (IV) oxide to diffuse through the same membrane (C=12,N=14,O=16) **(3 marks)**

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

11. The table below shows the relative atomic masses and the percentage abundance of the isotopes L_1 and L_2 of element **L**.

Isotope	Relative atomic mass	% abundance
L_1	62.93	69.09
L_2	64.93	30.91

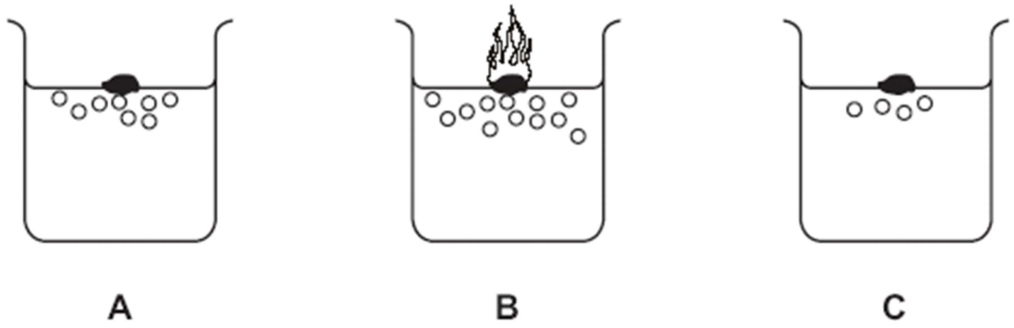
Calculate the relative atomic mass of element **L** **(3 marks)**

12. Use the information in the table about group 1 elements to answer the questions that follow

Element	Atomic radius(nm)
Lithium	0.123
Sodium	0.157
Potassium	0.203

.

When the group 1 elements react with water, hydrogen gas is given off. The diagram shows the reaction of the above three elements with water



(a) What is the general name of the group one elements **(1 mark)**

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

……
……
……

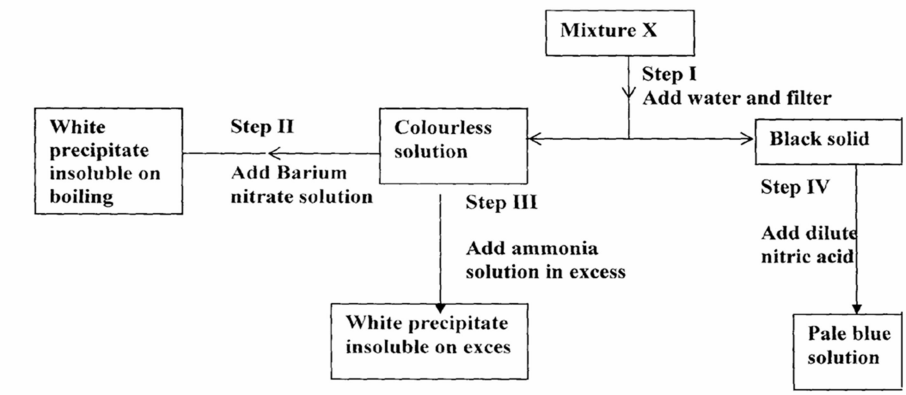
(b) Which one of these elements A, B or C is Lithium? **(1 mark)**

……
……
……

(c) Apart from fizzing describe **two** things that you would see when sodium reacts with water. **(2 marks)**

……
……
……

13. Study the chart below and answer the questions that follow.



(a) Name:

(i) Cations present in mixture X. **(1 mark)**

……
……

(ii) Anions present in the solution.

(1mark)

……
……
……

(b) Write an equation to show how the white precipitate in step III dissolves. **(1 mark)**

……
……
……

(c) Name the process outlined in step IV above. **(1 mark)**

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

……
……
……

14. Use the information in the table below to answer the questions that follow

Element	Sodium	Magnesium	Phosphorus	Chlorine
Electric conductivity	Good	Good	Poor	Poor
M.P (^oC)	98	660	44/115	-173

(a) Explain why both Sodium and Magnesium conducts electricity while phosphorus and chlorine do not.

(1 mark)

……
……

(b) Suggest a reason why phosphorus has been assigned two melting point values **(1 mark)**

……
……

c) Explain why atomic radii of elements in period 3 decreases generally from left to right in the periodic table **(1 mark)**

……
……

15. In an experiment, soap solution was added to three samples of water. The results below shows the volume of soap solution required to lather with $500cm^3$ of each water sample before and after boiling.

	Sample 1	Sample 2	Sample 3
Volume of soap used before water boiled	26.0	14.0	4.0
Volume of soap after water boiled	26.0	4.0	4.0

(i). Which water samples are likely to be soft **(1 mark)**

……
……

(ii) Explain the change in volume of soap solution used in sample 2 **(1 mark)**

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

……
……

16. Describe how the following reagents can be used to prepare lead sulphate. Solid potassium sulphate, solid lead carbonate, dilute nitric acid and distilled water. **(3 marks)**

.……
……
…………………………………………………………………………………………..…………
……………………………………………………………………………………………………

17. Using dots (.) and crosses(x) to represent -electrons show the bonding between oxygen and carbon to form carbon (ii) oxide. **(1 mark)**

18. 10g of ethanol (C_2H_5OH) were completely burnt in air. The heat evolved caused the temperature of $400cm^3$ of water to change from 20^0C to 85^0C. Calculate the molar enthalpy of combustion of ethanol. (H = 1, C = 12, O = 16. Specific heat capacity of water = 4.2 $Jkg^{-1}k^{-1}$) **(3 marks)**

19. The structures below represent two cleansing agents where R is along hydrocarbon chain. Which of the two cleansing agents is suitable for washing in water containing Calcium ions. Give a reason. **(2marks)**

20. Give the IUPAC name of the following organic compounds; **(2 marks)**

a) $CH_3CH_2CH_2CH_2CH_3$

b) $CH_3CHCH_2CH_2CH_3$ (with CH_3 attached to the second carbon)

$$\begin{array}{l} CH_3\underset{|}{C}HCH_2CH_2CH_3 \\ \quad\;\; CH_3 \end{array}$$

21 . The products formed by action of heat on nitrates of element A, B and C are shown below

Nitrate	Products formed
A	Metal oxide +Nitrogen (IV) Oxide + Oxygen
B	Metal +Oxygen (IV) Oxide
C	Metal nitrate + oxygen

(a) Arrange the metals in order of reactivity **(1 mark)**

……

……

……

(b) Which element forms a soluble carbonate **(1 mark)**

……

……

Give an example of B **(1 mark)**

……

……

22. Propane C_3H_8 and Carbon(IV)oxide diffuses at the same rate under the same conditions. Explain

(1 mark)

23. Although there are large reserves of iron and aluminium ores in the world, both metals are recycled.

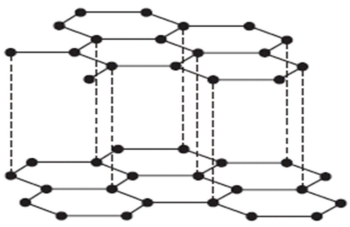
I. State one social benefit of recycling **{1 mark}**

II. Why is it particularly easy to separate iron from other scrap metals? **{1mark}**

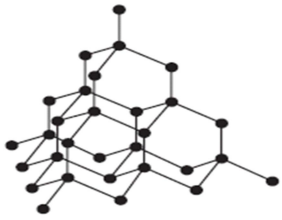
III. It is cheaper to recycle aluminum than it is to extract the metal from its ore. Give a reason. **{1mark}**

24. The diagrams show the structures of two forms, P and Q, of a solid element.

P



Q



Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

What are suitable uses of P and Q, based on their structures? **(2 marks)**

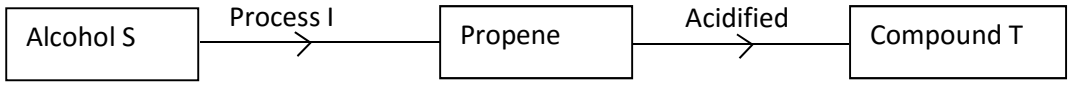
25. Fertilizers are added to the soil to improve crop yields. A farmer has a choice of two fertilizers, ammonium nitrate NH_4NO_3 or diammonium hydrogen phosphate $(NH_4)_2HPO_4$

(i) Show by calculation which of these fertilizers contains the greater percentage of nitrogen by mass **(3 marks)**

(N=14, H=1, O=16,P=31)

(ii) State one major problem caused when the nitrates from fertilizers leach from the soil into streams and rivers **(1 mark)**

26. Study the flow chart below.



(a). Write the structural formula of alcohol **S**. **(1 mark)**

(b) Name

(i) compound **T** **(1 mark)**

(ii) process **I** **(1 mark)**

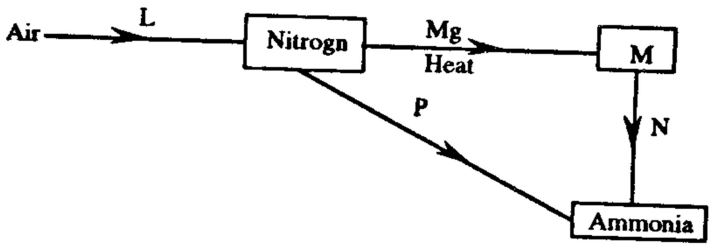
27. Students are advised to use a non-luminous flame for heating in the laboratory.

(a) How does a Bunsen burner produce a non-luminous flame? **(1 mark)**

(b) Give one reason why the advice is given to students. **(1 mark)**

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

28. Study the diagram below and answer the questions



(i) What is the process involved in step L **(1 mark)**

(ii) Explain how process N and P can be affected **(2marks)**

N

29. In an experiment to determine the solubility of solid Y in water at 30^0Cthe following results were obtained.

Mass of empty evaporating dish = 26.2g

Mass of evaporating dish + saturated solution = 42.4g

Mass of evaporating dish + dry solid = 30.4g

Use the data to calculate the solubility of Y at 30^0_C grams of Y per 100g water. **(3 marks)**

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

BRILLIANT EDUCATIONS
BRILLIANT PUBLISHERS
Tel: +254711-410-583
The Sign of Knowledge
Tr. Stephen O. Oketch

Name…… Adm no……

233/2

CHEMISTRY

PAPER 2
(THEORY)
TIME: 2 HOURS

TRIAL II
BRILLIANT PUBLISHERS PRE-MOCK 2020

Kenya Certificate of Secondary Education (K.C.S.E)

INSTRUCTIONS:

- Write your name and admission number in spaces provided above
- Answer **ALL** the questions in the spaces provided
- Mathematical tables and electronic calculators may be used
- All working must be clearly shown where necessary.

FOR EXAMINERS USE ONLY

Question	Maximum Score	Candidates score
1	12	
2	13	
3	13	
4	10	
5	12	
6	10	
7	10	
TOTAL SCORE	**80**	

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

This paper consists of 12 printed pages.
Candidates should check to ensure that all pages are printed as indicated and no questions are missing

1. (a) Use the information below to answer the questions that follow.

$$Ca_{(S)} + \tfrac{1}{2}O_{2(g)} \rightarrow CaO_{(S)} \qquad \Delta H = -635 \text{ KJ mol}^{-1}$$

$$Ca_{(S)} + O_{2(g)} \rightarrow CaO_{2(g)} \qquad \Delta H = -394 \text{ KJ mol}^{-1}$$

$$Ca_{(S)} + e_{(S)} + \tfrac{3}{2}O_{2(g)} \rightarrow CaCO_{3(S)} \qquad \Delta H = -1207 \text{ KJ mol}^{-1}$$

Calculate the enthalpy change for the reaction.

$$CaO_{(S)} + CO_{2(g)} \rightarrow CaCO_{3(S)}$$ **(3 marks)**

(b) State **one** factor that should be considered when choosing a fuel for cooking. **(1 mark)**

(c) The following data was obtained during an experiment to determine the molar heat of combustion of ethanol.

Volume of water used	= 500cm³
Initial temperature of water	= 25°C
Final temperature of water	= 44.5°C

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

Mass of ethanol + lamp before burning = 121.5g

Mass of ethanol + lamp after burning = 120.0g

Calculate the

(i) Heat evolved during the experiment (density of water = 1g/cm³, specific heat capacity of water = $4.2Jg^{-1}{}^{-}K^{1}$). **(1 mark)**

(ii) Molar heat of combustion of ethanol (C = 12, O = 16, H = 1). **(2 marks)**

(d) Write the thermo equation for the complete combustion of ethanol. **(1 mark)**

(e) At 298K and one atmosphere pressure, graphite changes into diamond according to the equation.

$$C_{(graphite)} \rightarrow C_{(diamond)} \qquad \Delta H = +2.9 \text{ KJ/mol}$$

In the space provided, sketch a simple energy level diagram for the above change. **(2 marks)**

(f). Study the information in the table below then answer the questions that follows.

Bond	Bond energy ($kJmol^{-1}$
H – H	435
Cl – Cl	243
H – Cl	431

Calculate the enthalpy change for the reaction.

$$H_{2(g)} + Cl_{2(g)} \rightarrow 2HCl_{(g)}$$ **(2 marks)**

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

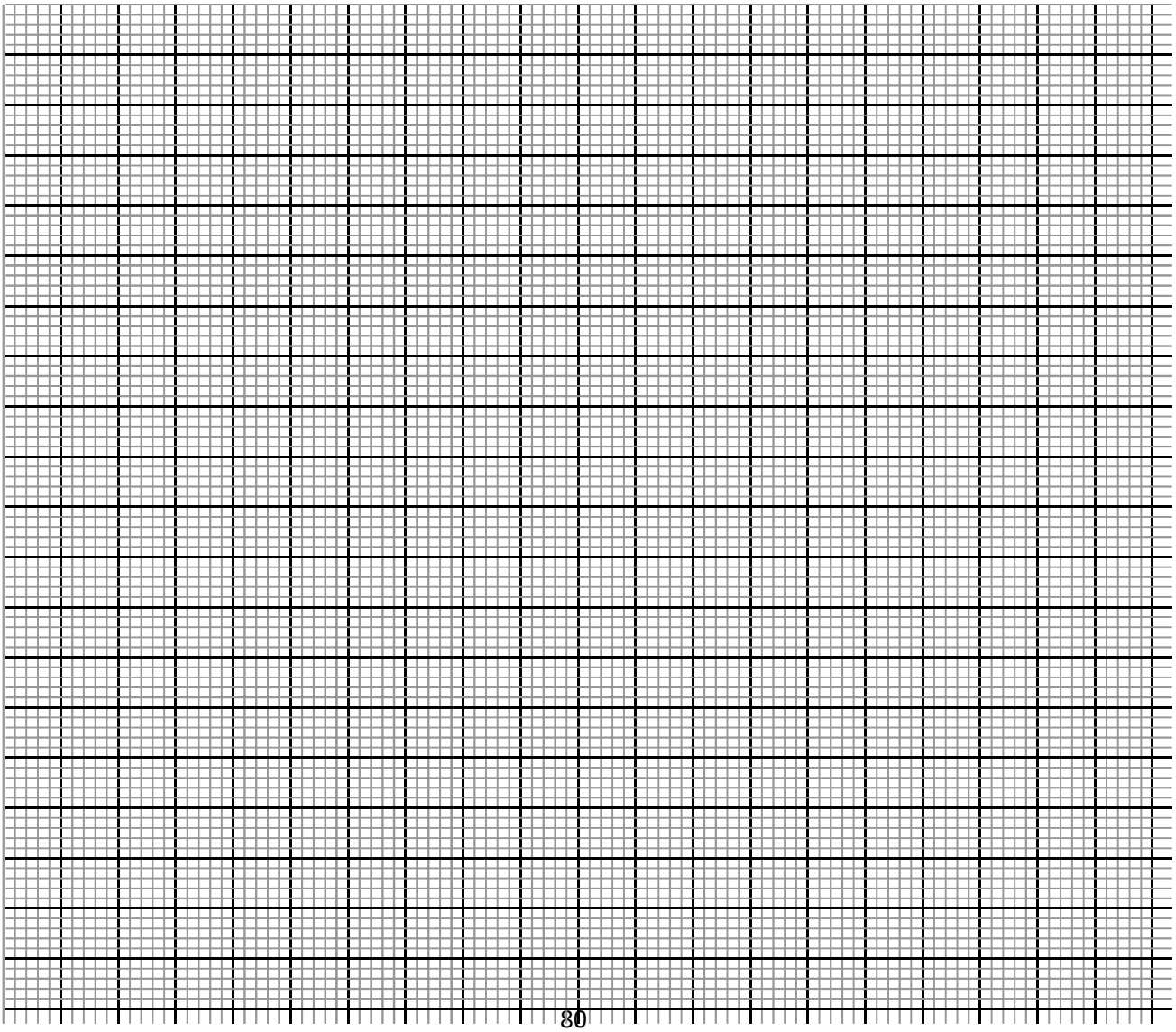
2. (a) At 25°C 50g of substance X were added to 100g of water to make a saturated solution.

What is meant a saturated solution? **(1 mark)**

(b) The table **below** gives the solubilities of substance X at different temperatures.

Temperature °C	14	24	33	40	46	52
Solubility g/100g H_2O	24	36	50	62	72	90

(i). Plot a graph of the solubility of substance X (vertical axis) against temperature. **(3 marks)**



Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

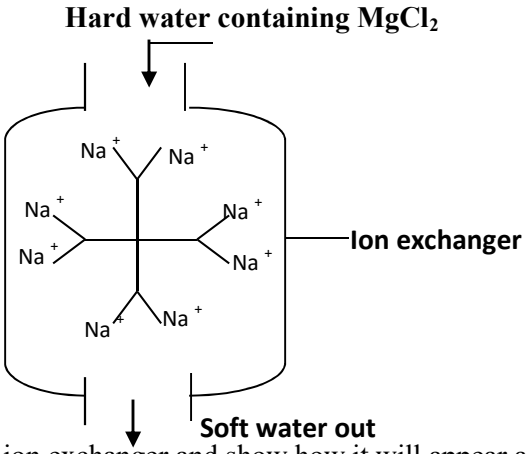
(ii) Using the graph.

I. Determine the solubility of substance X at 20°C. **(1 mark)**

II. Determine the mass of substance X that remained undissolved given that 90g of substance X were added to 100cm³ of water and warmed to 35°C. **(2 marks)**

III. Calculate the molarity of the solution at 30°C. (Relative formula mass of X = 122.5). **(3 marks)**

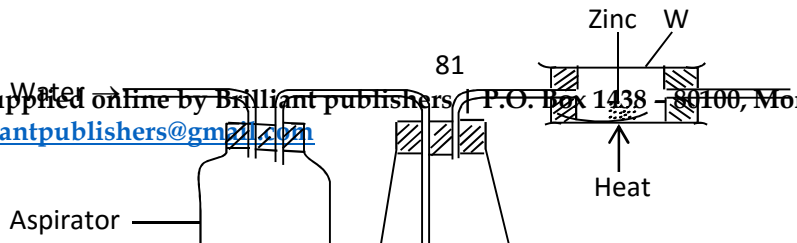
(c) The figure below shows an ion exchanger used to soften hard water



(i) Draw the ion exchanger and show how it will appear at the end of softening process. **(2 marks)**

(ii) How is the ion exchanger recharged after exhaustion **(1 mark)**

3.(a) Below is an incomplete diagram of a set-up of the apparatus used to obtain nitrogen gas from the air.



Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

(i) Complete the diagram to show how nitrogen gas is collected. **(1 mark)**

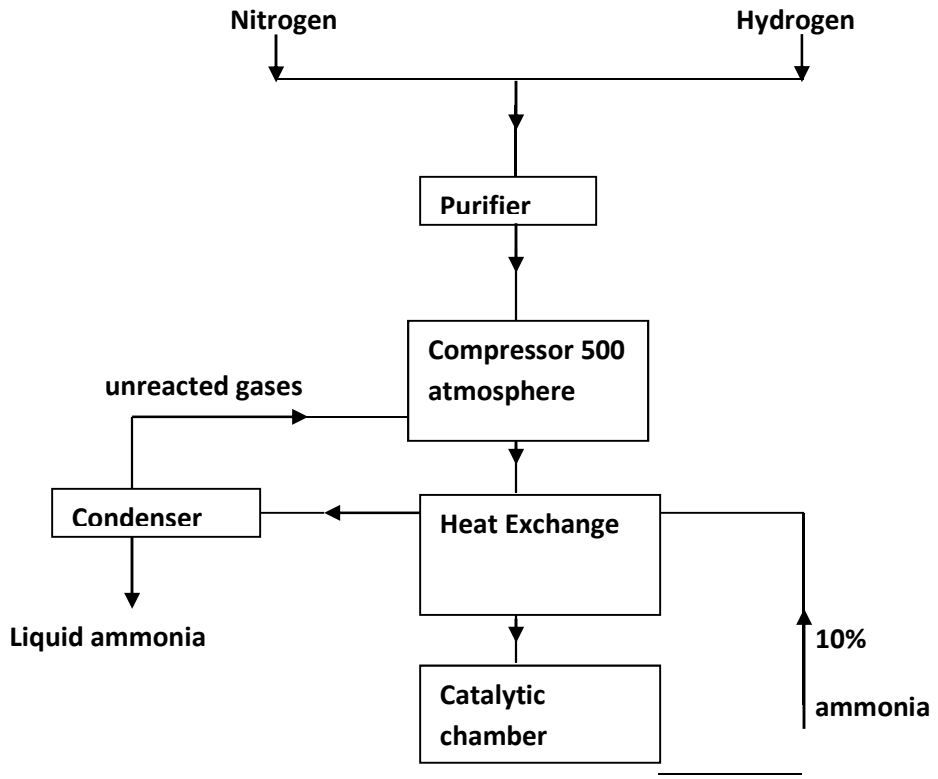
(ii) State the role of the following:

I Water entering the aspirator. **(1 mark)**

II Potassium hydroxide solution. **(1 mark)**

(iii).Write a chemical equation for the reaction that takes place in combustion tube. **(1 mark)**

(b).The diagram below represents the Haber's process for the manufacture of ammonia. Study it and answer the questions that follow.



Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

(i) Name any **two** impurities removed by the purifier. **(2 marks)**

(ii) Name the catalyst used in the process **(1 mark)**

.....

(iii) In the Haber's process the conversion of nitrogen and hydrogen into ammonia is only 10%.

The remaining unreacted gases are recycled. What is the advantage of recycling. **(1mark)**

.....

iv) A part from the catalyst and pressure of 500 atmospheres, name any other condition required for this process. **(1mark)**

(c) Give any **two** uses of ammonia **(1 mark)**

.....

..

d) In the manufacture of nitric (V) Acid from ammonia and air, ammonia is catalytically oxidized to nitrogen (II) oxide

(i) Name the catalyst used in the reaction. **(1mark)**

.....

..

(ii) Write a balanced chemical equation for the reaction between ammonia and air. **(1mark)**

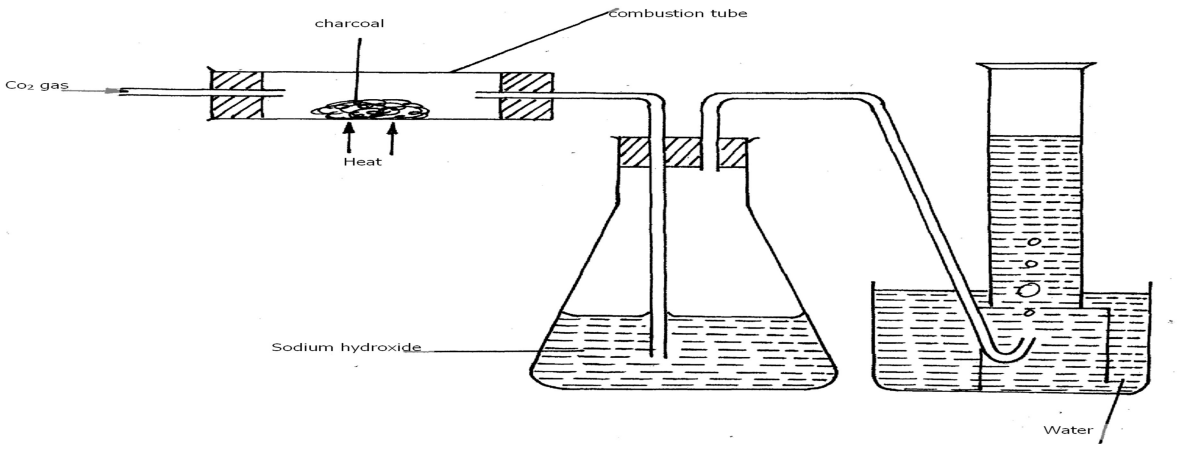
(iii) State **one** environmental problem likely to be faced in an area where nitric (v) acid manufacturing plant is located. **(1 mark)**

.....

..

4. In an experiment, carbon (IV) Oxide gas was passed over heated charcoal and the gas produced collected as shown in the diagram below.

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com



(i) Write an equation for the reaction that took place in the combustion tube . **(1 mark)**

(ii) Name another chemical substance that can be instead of sodium hydroxide . **(1 mark)**

(iii) Describe a simple chemical test to distinguish between carbon (II) Oxide and carbon (IV) Oxide **(2 marks)**

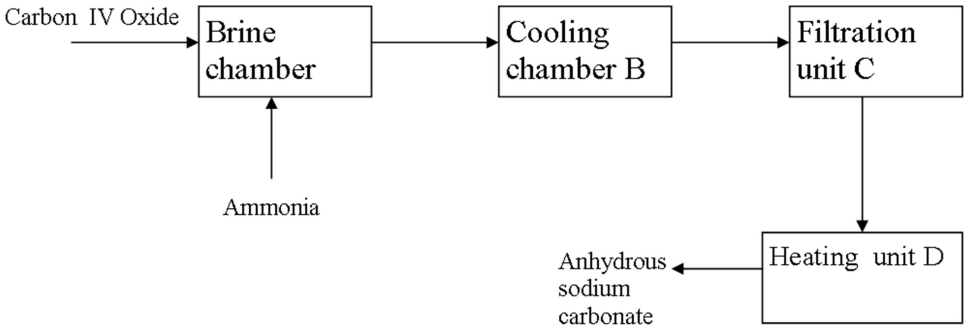
(**iv)** What is the purpose of sodium hydroxide in the above set-up **(1 mark)**

(v) What property of the gas makes it possible to be collected ass shown above? **(1 mark)**

(vi) State one use of carbon (II) oxide **(1 mark)**

(b) In order to prepare sodium carbonate in the laboratory, students passed carbon (IV) oxide and ammonia gas into brine as shown in the flow diagram below. Use it to answer the questions that follow:

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

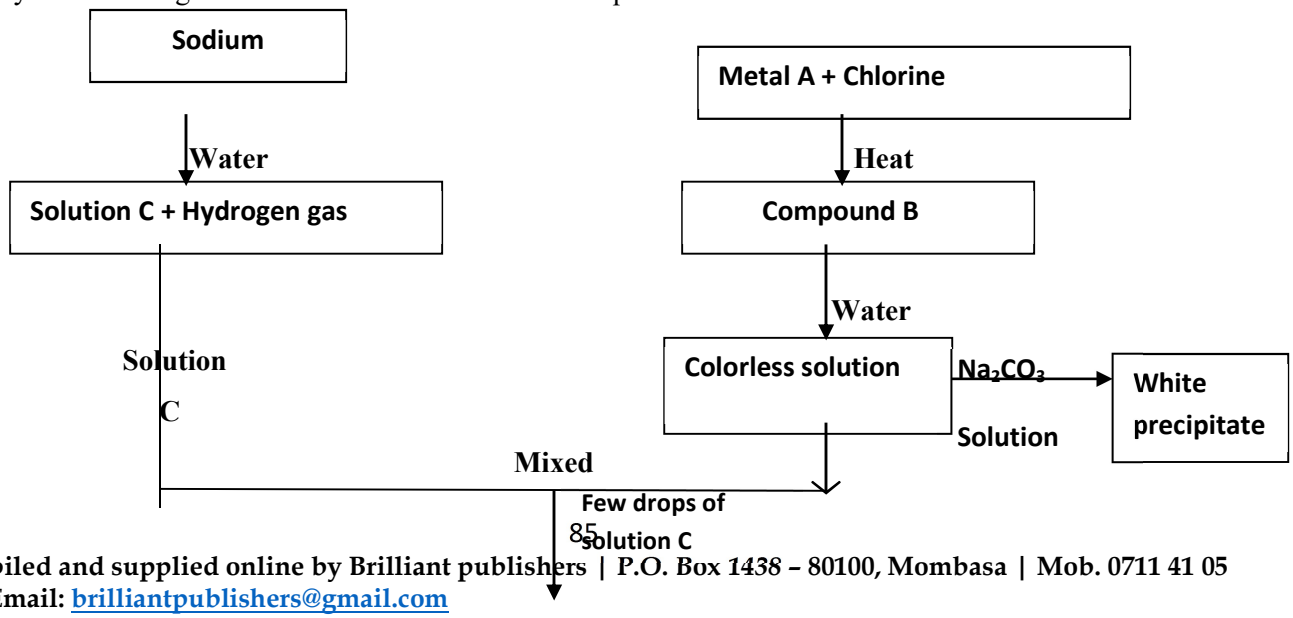


(i) Why is the mixture obtained in chamber A cooled down in chamber B? **(1 mark)**

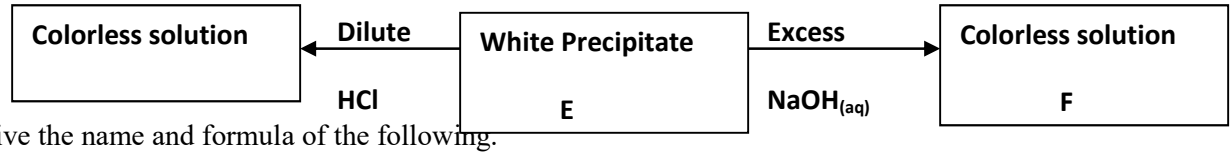
(ii) Write an equation for the reaction that recurs in the heating chamber D **(1 mark)**

(iii) Give a reason why it is difficult to prepare potassium carbonate by the same method. **(1 mark)**

5. Study the flow diagram below and use it to answer the questions that follow.



Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com



(a) Give the name and formula of the following.

(i) White precipitate **E**

Name

(1 mark)

Formula

(1 mark)

(ii) Colourless solution F

Name

(1 mark)

Formula

(1 mark)

(b) What property is exhibited by white precipitate E when it reacts with Sodium hydroxide and HCl acid.

(1mark)

(c) Write an ionic equation for the reaction between white precipitate E and excess sodium hydroxide solution.

(1 mark)

(d) You are provided with.

i) Potassium carbonate solid

ii) Zinc hydroxide

iii) Nitric (v) acid

iv) Distilled water

State briefly how you would prepare solid zinc carbonate using the reagents given**.** **(3 marks)**

.....

.....

.....

.....

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

.....

(e) Distinguish between a weak acid and a strong acid giving an example of each. **(1 mark)**

(f). Identify an acid in the forward reaction given by the equation below:

$$HSO_{4(aq)}^{-} + H_2O_{(l)} \leftrightharpoons H_2SO_{4(aq)} + OH_{(aq)}^{-}$$ **(1 mark)**

6. The grid below shows part of the periodic table. Use it to answer the questions that follow. The letters do not represent actual symbols.

						S	U	V
P	R					T	X	W
Q								

(a) Which of the elements has the largest atomic radius? Explain. **(2 marks)**

(b) Identify the most reactive non-metal. Explain. **(2 marks)**

(c) Compare the atomic radius of P and R. **(1 mark)**

(d) Give the formula of one stable ion with an electron arrangement of 2.8 which is:

(a) Negativity charged divalent ion. **(2 marks)**

(b) Positively charged monovalent.

(e) Given that the mass number of W is 40. Write down the composition of its nucleus. **(1 mark)**

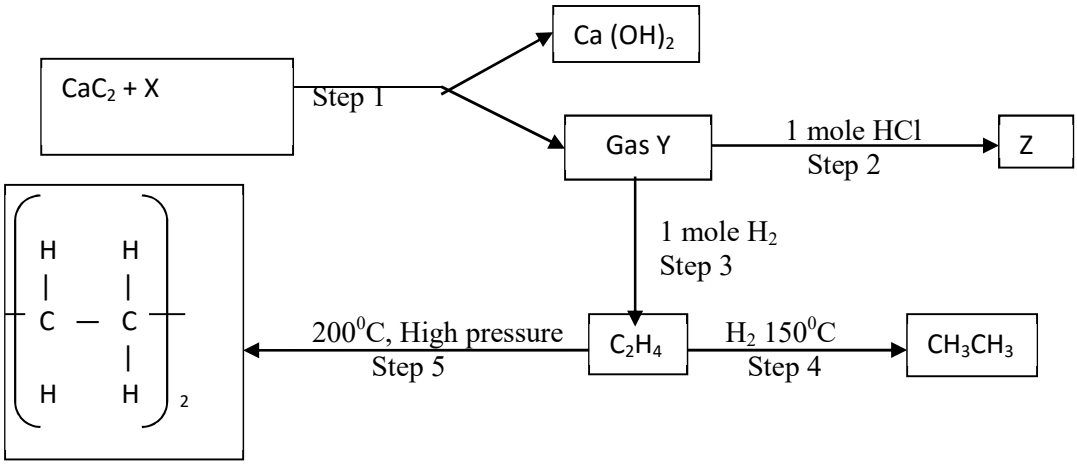
(f) Write the formula of the compounds formed between.

(i) Element R and X. **(1 mark)**

(ii) Give **one** property of the structure formed when R and X bond. **(1 mark)**

7. Study the diagram below and answer the questions that follow.

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

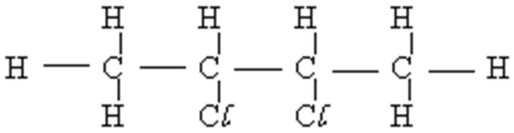


(i) Identify reagent X. **(1 mark)**

(ii) Draw the structural formula of gas Y. **(1 mark)**

(iii) What name is given to the process that takes place in step 5? **(1 mark)**

(b) An organic compound T reacts with chlorine gas in the presence of u.v light to form compound U. The structural formula of compound U is shown below.



Name the organic compound T and draw its structural formula. **(2marks)**

(c).The structure below represents two cleansing agents, L_1 and L_2.

$L_1 \rightarrow R - CH_2 - CH_3$

OSO_3Na^+

$L_2 \rightarrow R - COONa^+$

(i) Identify each of the two cleansing agents, L_1 and L_2.

L_1

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com

(½mark)

L_2

(½mark)

(ii). State a disadvantage of each of the above cleansing agents.
L_1

(½mark)

L_2

(½mark)

(d) In an experiment an organic compound was reacted with absolute ethanol in the presence of concentrated sulphuric (VI) acid to form a compound whose formula is $CH_3\ CH_2\ CH_2\ COOCH_2\ CH_3$. Name

I. The type of reaction that took place. **(1 mark)**

II. The name of the organic compound to which the compound belonged. **(1 mark)**

(e) Write the structural formula and give the systematic name of the acid used in the above experiment.
(1 mark)

Compiled and supplied online by Brilliant publishers | P.O. Box 1438 – 80100, Mombasa | Mob. 0711 41 05 83 | Email: brilliantpublishers@gmail.com