121/1
MATHEMATICS
PAPER 1
TIME: 2½ HOURS

Kenya Certificate of Secondary Education
Mock Examinations
Mathematics
Paper 1
2½ Hours.

INSTRUCTIONS TO CANDIDATES

- This paper contains **TWO** sections: Section **I** and section **II**
- Answer **All** questions in **Section I** and any other **FIVE** questions in **Section II.**
- Show all the steps in your calculations, giving your answer at each stage in the spaces below each question.
- Marks may be given for correct working even if the answer is wrong.
- No programmable silent electronic calculators and KNEC mathematical tables may be used, except where stated otherwise

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 questions in this section.

1. Without using a calculator or mathematical tables, evaluate;

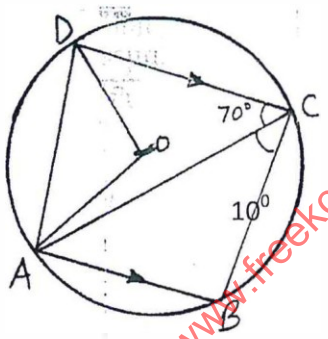
$$\frac{5}{6}-\frac{1}{3}of\frac{27}{20}\div 2$$ (4mks)

2. Find the equation of the perpendicular bisector of the line AB where the coordinates of A and B are (-3, 2) and (6, 4) respectively. (3mks)

3. Three bells P, Q and R are programmed to ring after an interval of 15 minutes, 25 minutes and 50 minutes respectively. If they all rang together at 8.45 a.m, when will they next ring together again. (4mks)

4. Simplify the expression $\frac{x+4}{x-4}-\frac{3x+12}{x^2-16}$ (3mks)

5. O is the centre of the circle below and AB is parallel to DC. Angle ACD = 70^0 and angle ACB = 10^0.

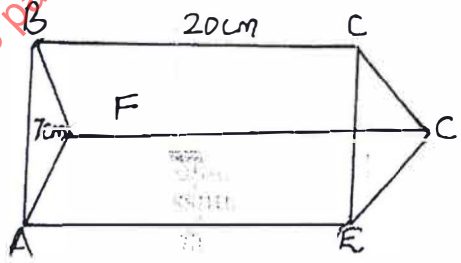


Calculate angles

(i) ABC

(ii) OAD (4mks)

6. A prism of length 20cm is represented by the diagram below whose cross section is an equilateral triangle of side 7cm.



(a) Draw a sketch net of the prism and label it correctly. (1mk)

(b) Calculate

(i) The area of the triangular end

(ii) The total surface area of the prism

(iii) The volume of the prism. (3mks)

7. Solve the following inequalities and represent the solutions on a single number line:

$2-2x<4$

$-6-3x\geq -15$ (3mks)

8. Solve for n in

$$\left(\frac{1}{49}\right)^{n} \times (343)^{-1} = 7$$ (2mks)

9. Solve the simultaneous equations

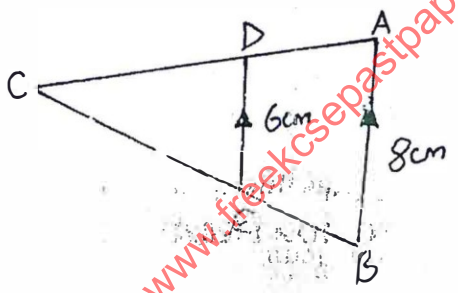
$$\log_4(2x+3y) = 2$$
$$\log_2(4x-y) = 2$$ (3mks)

10. In 2007 parliamentary election, only 55% of the voters in a constituency of 85,000 cast their votes. Of the votes cast, A received 48%, B received 32% and C received the remainder. How many votes did C receive. (3mks)

11. If each interior angle of a regular polygon is 150^0, how many sides does the polygon have?(2mks)

12. The expression $1-\frac{x}{2}$ is taken as an approximation for $\sqrt{1-x}$. Calculate the percentage error in doing so when $x = \frac{7}{16}$. (3mks)

13. (a) In the diagram below find the length of EC if BC = 12 cm.



(b) Given that the area of triangle DCE is 27 cm^2, find the area of ABECD. (4mks)

14. Point T is the midpoint of a straight line AB. Given that the position vectors of A and T are $-i+j-k$ and $3i+4j$ respectively, find the position vector of B in terms of i, j and k (2mks)

15. Given the coordinates of P, Q and R as (2, -1), (3, 4) and (6, 2) respectively, find the coordinates of P^1, Q^1 and R^1 the images of P, Q and R under a transformation represented by the matrix $\begin{pmatrix} -1 & 2 \\ 3 & 1 \end{pmatrix}$.

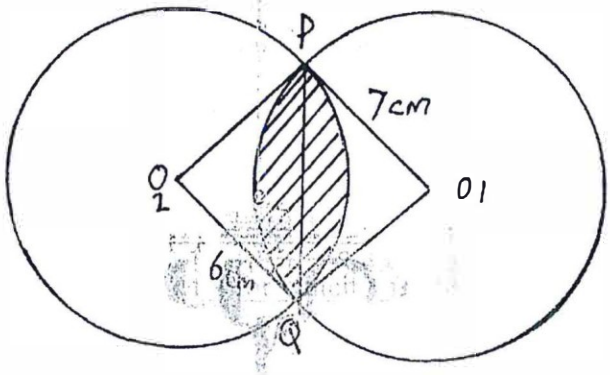
(3mks)

16. Given that θ is an acute angle and $\sin\theta = \frac{2\sqrt{3}}{5}$, find without using calculators or mathematical table, $\tan(90-x)^0$. (3mks)

SECTION II (50 MARKS)

Answer any five questions from this section.

17. 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.



Calculate the area of the shaded region in the above diagram to 4 significant figures. (10mks)

18. On some day, Mr. Makori bought some oranges worth ksh. 45. On another day of the same week, Mrs Makori spent the same amount of money but bought the oranges at a discount of 75 cents per orange.

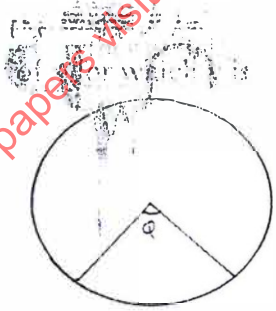
(a) If Mr. Makori bought an orange at sh x, write down a simplified expression for the total number of oranges bought by the two in the week. (3mks)

(b) If Mrs. Makori bought 2 oranges more than her husband, find how much each spent on an orange. (5mks)

(c) Find the number of oranges bought for the family that week. (2mks)

19. A cone is made by cutting off a sector as shown below from a circle and gluing the straight edges of the sector. The cone formed has slant height 14cm and circular base of perimeter 11cm

(take $\pi = \frac{22}{7}$)



(a) Calculate the value of θ. (2mks)

(b) The radius of the cone's circular base (2mks)

(c) The height of the cone. (3mks)

(d) The cone is cut uniformly on a horizontal plane 1cm below the apex. Calculate the slant height of the frustum so formed correct to 2 decimal places. (3mks)

20. (a) Draw the graph of $y = 2 + 3x - x^2$ in the range of $-3 \le x \le 6$ on the grid provided.(5mks)

b) From your graph:-

(i) Find the value of x if $x^2 - 4x = 0$ (3mks)

(ii) Determine the value of x for which y is the greatest. (1mk)

(iii) Determine the range of values of x for which y is positive. (1mk)

21. A Kenyan businesswoman wants to pay a company she owes US$ 100,000 in the united states of America. The woman can either pay through her account in Kenya or through her account in the united kingdom.

(a) If the exchange rate is;

1 US Dollar = 28.74 Kenya shillings
1 Sterling Pound = 1.79 US Dollars
1 Sterling Pound = 50.80 Kenya shillings,

Which method is cheaper and by how much? Give your answer in Kenya shillings.(4mks)

(b) Three years ago, Joseph was three times older than Agnes. In two years time the sum of their ages will be 75. Determine their present ages. (3mks)

(c) By use of reciprocals, evaluate the following and give answer to 3 decimal places

$$\frac{3}{0.0416}+\frac{5}{49.27}$$ (3mks)

22. A circular path of width 14 metrres surrounds a field of diameter 70 metres. The path is to be carpeted and the field to have a concrete slab with an exception of four rectangular holes each measuring 4 metres by 3 metres. A contractor estimated the cost of carpeting the path at sh. 300 per square metre and the cost of putting the concrete slab at sh. 400 per square metre. He then made a quotation which was 15% more than the total estimate. After completing the job, he realizes that 20% of the quotation was not spent.

(a) How much money was not spent? (8mks)

(b) Find the actual cost of the cotract (2mks)

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

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

(b) Another transformation represented by the matrix $\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$ maps $A^1B^1C^1$ onto $A^{11}B^{11}C^{11}$.

(i) Plot triangle $A^{11}B^{11}C^{11}$ on the same axes. (2mks)

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

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

24. The table below shows the height of tree in Manga forest in metres.

Height (m)	0-9	10-19	20-29	30-39	40-49	50-59	60-69
No of trees	50	35	30	32	16	10	7

Using an assumed meanof 34.5, calculate:-

(a) The mean (4mks)

(b) The median (3mks)

(c) The standard deviation (3mks)

Mock Examinations

121/2

MATHEMATICS

Paper 2

2 ½ Hours

SECTION I (50MARKS)

Answer ALL the questions in this section.

1. Use logarithms tables to evaluate

$$\sqrt[3]{\frac{36.72\times(0.46)^2}{185.4}}$$ (3mks)

2. Given that $\frac{2\sqrt{2}}{1+\sqrt{3}}-\frac{\sqrt{3}}{1-\sqrt{3}}=a+b\sqrt{c}$. Find the values of a, b and c. (3mks)

3. Given that the equation of a curve is $y=(2x+2)(x^2-3)$

   (i) Find the function of the gradient of the curve and its value when $x=\frac{3}{2}$ (2mks)

   (ii) Determine the equation of the normal to the curve at the point (-2, 3) (2mks)

4. A quantity f varies partly as t and partly as the square root of t. When t = 4, f = 22 and when t = 9, f = 42. Write the equation connecting f and t. (3mks)

5. (a) Expand $(2 + 2x)^5$ up to the forth term. (2mks)

   (b) Hence find the value of $(2.02)^5$ correct to 3 decimal place (2mks)

6. Find the distance between the centre A of a circle whose equation is $2x^2 + 2y^2 + 6x + 10y + 7 = 0$ and the point B (-4, 1) (3mks)

7. Machine A can do a piece of work in 8hours while machine B can do the same piece of work in 10 hours. The two machines were set to do the work together but after 2 ½ hours B broke down leaving A alone to complete the rest of the work. How long did it take machine A to do the remaining work. (3mks)

8. T is a transformation represented by the matrix $\begin{pmatrix}5x & 2\\ -3 & x\end{pmatrix}$ under T, a square of area 10cm^2 is mapped onto a square of area 110cm^2. Find the value of x (3mks)

9. Given that $2\cos(2x-30^0)=-\frac{6}{5}$ find x where $180^0\le x\le 360^0$ (3mks)

10. A cooker is valued at Ksh. 8000 if it appreciated by 10% in the first year, 12% in the second year and then 8% per annum in the subsequent years, determine its value at the end of 4 years. (3mks)

11. Make A the subject of the formula

$$T = \frac{2m}{n}\sqrt{\frac{L-A}{3K}}$$ (3mks)

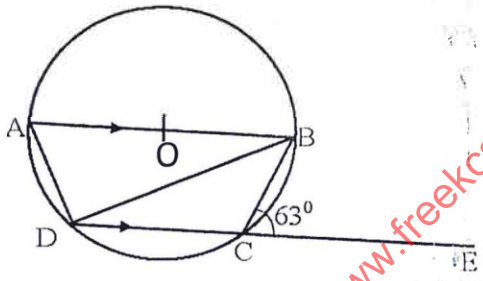
12. The sides of a triangle were measured to 1 decimal place as 6.5cm, 7.4cm and 8.2cm respectively. Calculate the percentage error in its perimeter (4mks)

13. Given that (5m – 2n) : (2m – n) = 7:5. find the ratio m:n (3mks)

14. A line L_1 is perpendicular to the line 2y + 3x = 6. Determine the acute angle made by the line L_1 and the x – axis (2mks)

15. A bus and a matatu starts from Nairobi to Kisii via Narok at the same time making a distance of 280km. The matatu averages 20km/h faster than the bus and reaches there 1 hour 36minutes earlier. Determine the speed of the bus. (3mks)

16. In the figure below the diameter AB of the circle is parallel to DC. DCE is a straight line and angle BCE = 63^0. Calculate the angle DBC. (3mks)



SECTION B (50 MARKS)

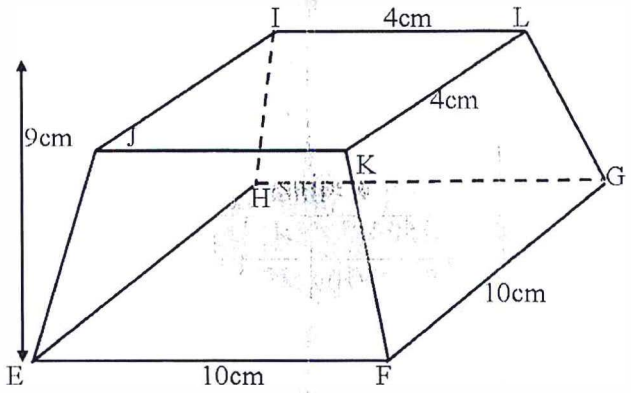
Answer any FIVE questions in this section.

17. Mr Ondati is a salaried civil servant. He earns a basic monthly salary of sh. 20,640, a house allowance of sh. 6,800p.m and medical allowance of sh. 2800p.m. He claims a family relief of sh. 400p.m. He pays sh. 300 per month and 2% of his salary towards water bills and NHIF respectively.
Calculate his net monthly salary in Ksh using the tax rates shown in the table below.

k£ p.a	Rate in Ksh per £
1 – 1980	2
1981 – 3960	3
3961 – 5940	5
5941 – 7920	7
7921 – 9900	9
9901 and over	10

(10mks)

18. In the figure below EFGHIJKL is a square based frustrum whose dimensions are as shown. The perpendicular height of the frustrum is 9cm. Given that EF = FG = GH = HE = 10cm and JK = KL = IL = IJ = 4cm.



(a) Calculate

(i) The altitude of the pyramid. (2mks)

(ii) The angle between the line FK and the base EFGH (2mks)

(iii) The angle between line LG and EF (3mks)

(b) The volume of the frustrum (3mks)

19. Complete the table for the function $y = (x+1)(x-2)^2$ for $-2 \le x \le 3$ (a) (1mk)

x	-2	-1	0	1	2	3
y		0		4		4

Draw the curve of function $y = (x+1)(x-2)^2$ in the domain $-2 \le x \le 3$ on a grid. (3mks)

(b) Using the mid-ordinate rule and strips of equal width of 0.5 estimate the area enclosed by the curve and the x – axis. (3mks)

(c) Find the exact area in (c) above (2mks)

(d) Calculate the percentage error in the area (b) above (1mk)

20. The position of two towns A and B on the earths surface are (36^0N, $49E^0$) and (36^0 N, 131^0 W) respectively.

(a) Find the difference in longitude between town A and town B (2mks)

(b) Given that the radius of the earth is 6370, calculate the distance between town A and town B

(i) In nm (2mks)

(ii) In kilometers (2mks)

(c) Another town C is 840km East of town B on the same latitude of town A and B. Find the longitude of town C (4mks)

21. In a certain mathematical relationship, the values of A and B are observed to satisfy the relationship $B = CA + KA^2$ where C and K are constants. Below is the table of values of A and B.

A	1	2	3	4	5	6
B	3.2	6.75	10.8	15.1	20	25.2

(a) By drawing a suitable straight line graph, determine the values of C and K (8mks)

(b) Write the relationship between A and B (1mk)

(c) Determine the value of B when A = 7 (1mk)

22. The table below shows the scores of Mathematics of a particular class in a certain school.

Marks	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100
Frequency	4	6	7	5	x	9	3	5	2	7

By taking an assumed mean to be 45.5 marks, the value of actual mean is 49.5 marks.

(a) Determine the value of x (3mks)

(b) Calculate the standard deviation (4mks)

(c) If 30 students passed the test. Calculate the pass mark (3mks)

23. The probability of Mary, Esther and John coming to school late on Monday are $\frac{1}{4}$, $\frac{2}{5}$ and $\frac{1}{3}$ respectively.

(a) Draw a tree diagram to represent the information. (2mks)

(b) Calculate the probability that

(i) All the three girls are late (2mks)

(ii) All except Esther are late (2mks)

(iii) At most two girls are late (2mks)

24. A carpenter makes two types of chairs for Keroka Secondary School. To make type A chair it requires 6 man – hours where as a type B requires 4 man – hours. The cost of material for type A is sh 120 and that for type B is sh100. The profit on type A is sh 80 and profit on type B is sh 60. The carpenter has to abide by the following conditions:

(i) A contract to supply 15 of type A and 10 of type B per week has to be fulfilled

(ii) Only 300 man – hours are available in each week.

(iii) Total weekly cost of material for all chairs should not exceed sh 6000

If type A and type B chairs were x and y per week respectively.

(a) Write down the inequalities satisfying these conditions (4mks)

(b) Represent this information on a grid and show the region by shading out the unwanted. (4mks)

(c) What values of x and y will give maximum profit. Determine this maximum profit.(2mks)

Mock Examinations
101/1
ENGLISH
Paper 1
2 hours

ANSWER ALL QUESTIONS

1. (a) Your form four class has emerged the best in term one examinations. The Principal of your school has rewarded the class with a three day trip to Mombasa.

Write a **personal Journal** where you recorded the memorable events for those three days. (13 marks)

Your parent has given you Kenyan shillings 800/= for your shopping.

(b) Write a **shopping list** of personal effects that you would need during the trip. (7 marks)

2 ***Read the passage below and fill in each blank space with the most appropriate word (10 marks)***

The recently released 2015 Kenya Certificate of Secondary Education(KCSE) examination results had ……..(1) record number of cases of alleged cheating. Indeed these are ……..(2) allegations because the victims are never given a change to give their side of the ……..(3). Cheating should be condemned by all as it……(4) down the quality of education in the Country as well as presenting to the economy professionals who are not well-suited ……..(5) their roles. The dilemma,……, (6) is the unfair manner in which students find themselves in this fiasco. Students have no capacity to engage in examination cheating. ……..(7) it was commercialized, vice has taken a new ……(8) and it involves a deep pocket to access the examinations beforehand. What……(9) does a student have when a paper is presented to him for revision? How does he tell……..(10) it is the real paper or not?

3. ***Read the story below and answer the questions that follow***

WHY TURTLES LIVE IN WATER

Story, story!

Turtles used to live on the land, they say, until the time a clever turtle was caught by some hunters. They brought him t o their village and placed the turtle before the Chief, who said, "How shall we cook him?"

"You'll have to kill me first," said the turtle, "and take me out of this shell."

"We'll break your shell with sticks," they said.

"That'll never work," said the turtle, "Why don't you throw me in water and drown me?"

"Excellent idea," said the Chief. They took the turtle to the river and threw him into the water to drown him.

They were congratulating themselves on their success in drowning the turtle, when two little green eyes poked up in the water and the laughing turtle said, "Don't get those cooking pots out too fast, foolish people!" As he swam away he said, "I think I'll spend most of my time from now on, safely in the water."

It has been that way ever since!

(a) What is the significance of using the words-story, story! (2 marks)

(b) Your classmate has been appointed to narrate the story before an audience. He has come to you for advice on how to prepare well for the narration. Write down the suggestions you will tell him to consider. (4 marks)

(c) How would your voice fall or rise at the end of the following sentences (2 marks)

i) Why don't you throw me in the water and drown me?

ii) It has been that way ever since!

(d) Your class has organized for a group discussion on which set book between **The River and the Source and Caucasian Chalk Circle** you should stage a play from. What would you do to ensure that the discussion is orderly. (6 marks)

(e) **Give *another word that is pronounced the same as the following*** (5 marks)

i) Lesson.....

ii) Mall.....

iii) Suite .....

iv) Blue.....

v) Each.....

(f) ***Group the following words according to the sound of the underlined letters*** (5 marks)

thin, share, thigh, chores, Jug, parachute, arch, thy, Judge, this

/ʃ/	/dʒ/	/tʃ/	/θ/	/ð/

(g) You have performed very well in your KCSE and qualified for a course in medicine which is your parents choice but you would like to do music. Fill in the missing responses. (6 marks)

Father: Hallo John, how are you?

John: .....(1 marks)

Father: Have you checked on your results?

John: ..... (2 marks)

Father: Oh congratulations! We are proud of you. You definitely qualify for medicine.

John: .....(2 marks)

Father: What do you mean? A course in medicine is prestigious. You cannot compare it with music

John: .....(1 marks)

Father: Alright son. Do what suits you. It's your own life.

Mock Examinations
101/2
ENGLISH
(Comprehension, Literary, Appreciation and Grammar)
PAPER 2
TIME: 2½ HRS

1. Read the following passage and answer the questions that follow:- (20 MARKS)

Our emphasis on money and industries has made us concentrate on urban development. We recognize that we do have enough money to bring the kind of development to each village which would benefit everybody. We also know that we cannot establish an industry in each village and through this means effect a rise in the real incomes of the people. For these reasons, we spend most of our money in urban areas and our industries are established in the towns.

Yet the greater part of this money that we spend in the towns comes from loans. Whether it is used to build schools, hospitals, houses or factories etc. It still has to be repaid. But it is obvious that it cannot be repaid just out of the money obtained from urban and industrial development. To repay the loans we have to use foreign currency which is obtained from the sale of our exports. But we do not now sell our industrial products in foreign markets, and indeed it it likely to be a long time before our industries produce for export. The main aim of our new industries is import substitution - that is to produce things which **hitherto** we have had to import from foreign countries.

It is therefore obvious that the foreign currency we shall use to pay back the loans used in the development of the urban area will not come from the towns or industries. Where then shall we get it from? We shall get if from the villages and from agriculture. What does this mean? It mean that the people who benefit directly from development which is brought by borrowed money, are not the ones who will repay the loans. The largest proportion of the loans will be spent in and for the urban area, but the largest proportion of the loans will be spent through the efforts of the farmers.

This fact should always be **borne in mind** for there are various forms of exploitation. We must not forget that people who live in towns can possibly become the exploiters of those who live in rural areas. All our big hospitals are in towns and they benefit only a small section of the people of Tanzania. Yet it we have built them with loans from outside Tanzania, it is the overseas sale of peasants' produce' produce, which provides the foreign exchange for repayment. Those who do not get the benefit of the hospitals thus carry major responsibility of paying for them. Tarmac roads with loans, it it again the farmer who produces the goods who will pay for them. What is more, the foreign exchange with which the car is bought also comes the sale of the farmers' produce. Again, electric lights, water pipes, hotels and other aspects of modern developments are mostly found in towns. Most of them have been built with loans and most of them do not benefit the farmer directly, although they will be paid for by the foreign exchange earned by the sale of this produce. We should always bear this in mind.

Although when we talk of exploitation we usually think of capitalists, we should not forget that there are many small fish in the sea. They eat each other. The large ones eat the small ones and the small ones eat those who are even smaller. There are two possible ways of dividing the people in our country. We can put the capitalists and feudalists on one side, and the peasants and workers on the other. But we can also divide

the people into urban dwellers on one side and those who live in the rural areas on the other. If we are not careful, we might get to the position where the real exploitation in Tanzania is that of the town dwellers exploiting the peasants.

a) What is the author's main argument in the first paragraph? (2mks)
b) According to the passage, what are the sources of money used to repay loans obtained by Tanzania? (2mks)

c) In not more than 50 words, summarize the reasons why the town people are considered exploiters. (6 mks)

d) Mention two challenges facing the Tanzania government as brought out in the passage. (2mks)

e) Explain how appropriate the figure of speech in the last paragraph is in relation to the author's argument. (3mks)

f) The author says: "This fact should always be borne in mind....." Which fact is he referring to and why should it be borne in mind? (2mks)

g) We must not forget that people who live in towns can possibly exploit those who live in rural areas . (Rewrite in the passive). (1mk)

h) Explain the meaning of the following words as used in the passage. (3mks)
i) hitherto .....

ii) borne in mind .....

2. Read the following excerpt carefully and answer the questions that follow. (25marks)
Except for Kithinji Makau who seemed to have trouble handling the cadaver, the other five soon formed a good team. One person would read from the manual, another would dissect and separate the tissues and the rest would try to identify the revealed structures. Anatomy was the human body into a doctor's head; it was just a test of one's power of recall- an invaluable tool for a doctor. To carry in one's head the names, distribution and function of hundreds of muscles, nerves, blood vessels, parts of the brain, the skeleton, and all the internal organs require a no mean feat of memorization.

However it soon became clear that two people were fighting for the top position in anatomy. They were both from table six - Aoro Sigu and that slip of a girl Wandia Mugo. There were other subjects to be learned including Biochemistry and physiology, but none caused as much tension and rivalry as anatomy. If you saw a medic mumbling to himself, it was not because he was at prayer, the poor guy was practicing his anatomy. By the end of the third and last semester, the battle for supremacy in anatomy became palpable. People slept with their Cunningham's Manual and their Gray's Text Book of Anatomy. Where two or three were gathered together, anatomy was the main subject. Finally the day came. The written papers were done and the day for practical's came. You could have cut the tension with a knife after everyone took his place under a microscope.

Each time the bell rang one had to move to the next item, irrespective of whether one had managed

to identify the previous one or not. The time was fixed.

Questions

a) Name any other two members of the team not mentioned in this passage and briefly describe their first reaction at the dissecting table. (3mks)

b) Compare Aoro Sigu and Wandia Mugo in this passage. (2mks)

c) Identify two thematic concerns highlighted in this excerpt. (4mks)

d) Each time the bell rang one had to move to the next item, irrespective of whether one had managed to identify the previous one or not. (Begin, Irrespective.....end.....rang) (1mk)

e) Make notes on the author's description of anatomy. (3mks)

f) Explain an incident in the past that explains Aoro's passion for medicine. (4mks)

g) Describe the mood of the third and last semester as brought out in the excerpt. (2mks)

h) "Where two or three were gathered together....." comment on the stylistic device employed here. (3mks)

i) How does the battle for supremacy in anatomy end? (2mks)

j) Explain the meaning of 'palpable' as used in the excerpt. (1mk)

3. POETRY

Read the poem below and then answer the questions that follow: (20mks)

ONCE UPON A TIME

Once upon a time dear son
They used to laugh with their hearts
And laugh with their eyes, but now they only
Laugh with their teeth
While their ice-cold-block-eyes
Search behind my shadow

There was a time indeed
They used to shake hands with their hearts
But that's gone son
Now they shake hands without hearts
As their hands search my empty pockets
'feel at home', come again'
They say but when I come
Again and feel at home, once, twice
There will be no thrice
For then I find the doors shut on me

So I have learned many things, son
I have learned to wear many faces
Like dresses, home face, office face,
Cocktail face
With all their conforming smiles
Like a fixed portrait smile
And I have learned too
To laugh with only my teeth

And shake hands without my heart
I have also learned to say "Goodbye"
When I mean 'Good riddance'
To say 'Glad to meet you'
Without being glad: and to say 'it has been
Nice talking to you' after being bored
But believe me son I want to be what I used to be when I
was like you

I want to unlearn these muting things
Most of all, I want to re-learn
How to laugh, show me how
I used to laugh and smile
Once upon a time when I was like you

Questions

a) Who is the persona in the poem? (2mks)

b) Briefly describe what the poem is about? (3mks)

c) Identify any two images that emphasise what the persona is saying. (2mks)

d) Explain two poetic devices used in the poem. (4mks)

e) Explain the following lines as used in the poem. (3mks)
i) Like fixed portrait smile
ii) I want to unlearn these muting things.
iii) Laugh with their teeth

f) What is the relationship between the persona and the son? (2mks)

g) Describe the tone of the poem? (3mks)

h) Suggest an alternative title to the poem. (1mk)

15. GRAMMAR (15 MARKS)

a) Rewrite the following question according to the instructions given after each. Do not change the meaning. (4mks)

i) It was the first time the school performed well.
(Begin: Never before .....)

ii) Mount Kilimanjaro is the highest mountain in Africa.
(Rewrite using- higher - instead of -highest-)

iii) The residents have succeeded in cleaning up the estate, what is more, they have made it the cleanest in the entire region. (Rewrite using - not only-)

iv) I did not know that there was trouble ahead.
(Begin: Little .....)

b) Each of the following sentences has two different meanings.
Write down the two meanings of each. (2 marks)

i) There is a man on that chair that has a broken leg.

ii) Eating monkeys can be interesting.

c) Replace the underlined word with a phrasal verb formed from the word in brackets. (2mks)

i) All his friends were at the airport to escort him. (see)

ii) Simon was shocked by the news of the closure of Nakumatt supermarket. (take)

d) Fill in the blank spaces with the appropriate preposition. (3mks)

i) They make clothes .....cotton.
ii) Mr Maina was sentenced .....child neglect but acquitted..... murder.

e) Complete the following sentences using the correct form of the word in brackets. (2mks)

i) The criminal's .....behaviour in court appalled the judge. (scandal)
ii) Hardly had the baby .....down when the mother began to clean the house. (lie)

f) Complete the following sentences with the appropriate question tag. (2mks)

i) We need to learn to prioritize, ...
ii) Come and visit us tomorrow, ...

102/1
KISWAHILI
Karatasi ya Kwanza
(INSHA)

1. LAZIMA

Umepata nafasi ya kumhoji Msimamizi mkuu wa Baraza la Mitihani nchini, kuhusu athari za wizi wa mtihani wa Kitaifa katika shule za Sekondari. Andika mahojiano haya.

2. Pendekeza njia za kukabiliana na ongezeko la visa vya utovu wa maadili miongoni mwa vijana katika jamii.
3. Andika kisa kinachooana na methali mchelea mwana kulia hulia mwenyewe.
4. Tunga kisa kinachomalizika kwa maneno haya:

. . . hapo ndipo iliponipambazukia kuwa nilikuwa naogelea baharini pekee kinyume na wenzangu wote.

KISWAHILI
Karatasi ya Pili

(Ufahamu, ufupisho, matumizi ya lugha na Isimu jamii)
Muda: Saa 2½

A. UFAHAMU (alama 15)

Soma ufahamu unaofuata kisha ujibu maswali yanayofuatia. Macho ya Abdul yalipigwa na mwali mkali wa jua la asubuhi. Ilikuwa ndiyo mara yake ya kwanza kuuona mwanga halisi wa ombwe lijiitalo dunia tangu alipohukumiwa kifungo gerezani. Punde tu komeo la mlango wa seli lilipofunguliwa, ilimlazimu Abdul ayafumbe macho kabla ya kuyafumbua tena taratibu ili yazoee mabadiliko yake.

Ilikuwa ndiyo siku ya Abdul ya kuachiliwa huru kutoka kwenye kifungo kirefu kilichoyapa macho yake mazoea ya giza la kaburi mle gerezeni. Macho yake yalipokwishaizoea ile hali na kumhakikishia kuwa kila alichokuwa akikiona si kizuka ila uhalisia, alipiga hatua. Akatoka nje ya mlango wa seli, kisha kwa kutoamini, akageuka nyuma kulitazama tena lile pango alimokuwa ametikwa katika muda huo wote.

Akayafikicha macho kwa kutoamini huku machozi yakimdondoka asijue kama yalikuwa ya furaha au ya huzuni. Alipogeuka kuanza safari ya uhuru wake, macho yake yalikumbana na lango la gereza . Hapo, akasita kidogo, labda kuhakikisha kama kweli alikuwa huru. Bila shaka, hakuna askari wa gereza aliyemshikia bunduki au kumuamuru asimame. Walimtazama tu na kumpa tabasamu.

Taratibu, Abdul aliendelea kupiga hatua. Mhemko aliokuwa nao kutokana na hewa safi iliyompenya mapafuni uliufanya moyo wake upige kwa kasi. Ghafla, tabasamu ikapasua mashavuni pake. Akasita. Akaiinua pua yake iliyompa hakikisho kuwa uvundo na uozo wa seli haukuwa naye tena. Ingawa mwili wake uiijaa mabaka ya uchafu na matambara yaliyouficha uchi wake kuvunda, hilo halikumkera tena.

Kwa hivyo, akatia tena tabasamu. Lake kuu lilikuwa shukrani kwa kuepuka yale madhila ya joto na rundo la wafungwa. Na kama hilo halikutosha, aligeuka tena ili sasa kuliangalia lile gereza. Bila kutarajia, alipiga magoti, akainua mikono kupiga dua, "Ewe Mungu, niepushe na balaa nyingine."

Safari ya Abdul kutoka katika majengo ya gereza ilikumbwa na mseto wa mawazo. Alipokuwa katika ujia uliomwelekeza katika barabara kuu, mambo mengi yalimpitikia mawazoni asipate jawabu. Hakujua kama wazazi wake walikuwa wangali . hai, na kama walikuwa bado wanaishi katika nyumba ile ya kukodi kwa miaka hiyo kumi aliyokuwa jela, 'Je, nikiwakosa, nitaenda wapi? Nitaanzia wapi kuwatafuta?' Mawazo hayo yaliifungua mifereji ya machozi, kisha ile ya makamasi, Balagha hiyo ilimfikisha katika kituo cha magari ya uchukuzi kwa ule aliouona kuwa muda wa kufumba na kufumbua. Aliyafuta.machozi yake haraka kwa kiganja kisha akaziba tundu la pua, tayari kupenga kamasi. Hata hivyo, kabla hajafanya hivyo, nafsi yake ilimtahadharisha kuwa hatua hiyo ingekatiza uhuru aliopewa kwa kuchafua mazingira.

Kwa hivyo akaghairi. Akavuta ncha ya shati lake na kuitumia kama hankachifu kutimiza azma yake. Hapo kituoni, matatu iliyokuwa mbele ilikuwa na watu wachache. Abdul akaingia na kukaa upande wa kioo ambapo tafakuri nyingi zilimjia. Akakumbuka jinsi kesi yake ilivyoendeshwa kinyume kabisa na ukweli na hukumu kutolewa kinyume cha haki. Mimi Abdul, mtoto twaa tangu kuzaliwa kwangu hata mdudu sijawahi kumponda kwa udole wangu, ndiyo sasa hije kusingiziwa kuua mtu? Mungu wangu! Kwa nini dunia hii haina wema? Kwa nini wanaodaiwa kuwa wasomi hata wakapewa jukumu la kuwakilisha maslahi ya raia ndio wanaowadhulumu hao raia? Hivi, hata hukimu na tajiriba yake aliamua kufuatilia zile porojo za wanaojiita majasusi? Angeahirisha hukumu yake ili kufanya uchunguzi zaidi, bila shaka nisingepata mapigo na dhuluma hizo zote. Kwa kweli, hii ni dunia ya mwenye nguvu mpishe! Abdul alijisemea.

Maswali

a) Kwa nini Abdul alifungwa? (alama 2)

b) Kwa kurejelea kifungu eleza mashaka katika asasi za kurekebisha tabia. (alama 4)

c) Ni kinyume kipi kinachoonekana katika kifunga hiki? (alama 2)

d) Ni mambo yapi yaliyomtia Abdul machugamachuga alipoachiliwa huru. (alama 3)

e) Abdul anaelekea kuwa na uhulka gani. Fafanua kwa kurejelea kifungu. (alama 2)

f) Msamiati ufuatao una maana gani kwa mujibu wa kifungu hiki. (alama 2)

i) Ombwe .....

ii) Mhemko.....

2. MUHTASARI (alama 15)

Soma makala yafuatayo kisa ujibu maswali.

Swala la nidhamu ni nyeti sana ambalo lafaa kushughulikiwa ipasavyo ili mambo yawe shwari katika ulimwengu. Nidhamu inapodumlshwa basi maswala mengine huwa rahisi kutekeleza popote pale. Katika Biblia ni dhahiri kuwa Bwana Mungu aliumba mwanadamu kamilifu, Adamu, akamweka katika bustani ya Edeni ili atawale viumbe wengine. Mungu alimpa Adamu uhuru wa kula chochote alichotaka katika bustani ya Edeni lakini akamkataza kula matunda kutoka kwa mti uliokuwa katikati ya bustani hiyo. Baadaye Mungu akagundua kuwa Adamu alikuwa na kitwa cha ajabu kisha akaamua kuumba Hawa ili awe msaidizi wake. Bila shaka Adamu alifurahi kwa hatua hii. Hata hivyo, Hawa alindanganywa na

shetani aliyekuja, kwa mfano wa nyoka, akala tunda walilokatazwa na Mungu na hatimaye akampelekea Adamu naye akala. Matokeo yalikuwa kwamba walijipata uchi kisha Mungu akakasirika nao na kuwafukuza kutoka kwa bustani na kuwapa adhabu.

Mwanamume aliambiwa kuwa angefanya kazi na kutokwa na jasho ili apate chakula. Mke naye aliambiwa kuwa kujifungua kungekuwa na uchungu mwingi. Naye nyoka akaambiwa atakuwa na uadui mkubwa kati yake na mwanadamu na angekuwa akifa kwa kugongwa kwenye kichwa. Hata hivyo Mungu hakuwatekeleza wanadamu kabisa. Bwana Mungu alimtuma Yesu akafa mtini ili kila amwaminiye asije akaangamia, bali aweze kupata uzima wa milele. Ni dhahiri kuwa Mungu alikosewa sana na wanadamu aliowaumba lakini hakuwatupa kabisa bali aliwajalia nafasi nyingine ya kuwa wana wake. Ikiwa Mungu alifanya haya, sembuse sisi binadamu?

Kila mwanadamu hukosea na ni vyema njia mwafaka zifuatwe katika kutekeleza adhabu ili anayeadhibiwa aweze kubadilika na kuona makosa yake. Adhabu inapotolewa ni vyema kwanza kuchunguza cha kitendo. sababu zinazopelekea kutendeka kwa kitendo hicho, dhamira ya mtendaji na athari za kitendo husika, Baada ya haya. mhusika atakuwa katika hali bora ya kutekeleza adhabu.

Katika nchi yetu kwa mfano, adhabu hutolewa katika asasi mbalimbali kama vile shule, vyuo, ndoa kanisa msikiti miongoni mwa asasi nyingine. Katika ndoa kwa mfano, mke anapokosea mumewe adhabu lazima iambatane na sera za kijamii na kimataifa. Kwa mfano, swala la kuwapiga wanawake au wanaume katika ndoa halifai kabisa katika ndoa yoyote hata kama mtu amefanya kosa gani! Kuna njia mwafaka za kuleta masikilizano katika ndoa kama vile kushauriana, kuomba ushauri, nasaha au pia kwenda kanisani. Pia mambo yamezidi sana ambapo wanawake wakichulumiwa wanaishia kuwaumiza waume zao sana au hata kuwaua! Swali ni je, ukiua mtu umesuluhisha tatizo lolote? Adhabu yoyote lazima iambatane na uzito wa kosa na pia athari zake kwa mhusika lazima zichunguzwe kabla ya adhabu yenyewe kutolewa.

Maswali

a) Fupisha aya mbili za kwanza. (maneno 60 - 80) (alama 10, moja ya utiririko)

NAKALA CHAFU

NAKALA SAFI

b) Fupisha aya ya tatu. (alama 5, Moja ya utiririko)

NAKALA CHAFU

Jibu

C. SARUFI NA MATUMIZI YA LUGHA. (alama 40)

a) Andika sifa zozote mbili za sauti zifuatazo. (alama 2)

i) /u/

.....

ii) /ch/

.....

b) Tenga silabi katika maneno yafuatayo kisha uandike muundo wake. (alama 2)

i) igwa

.....

ii) oa

.....

c) Andika upya sentensi kwa kutumia 'O' rejeshi tamati. (alama 2)
Gari lililoanguka si lile unalolizungumzia.

d) Unda nomino kutokana na kivumishi kifuatacho. (alama 1)
Tepetevu.

e) Badilisha katika usemi wa taarifa. (alama 3)
Afisa wa usalama alisema kuwa wangemsaidia ikiwa angeshirikiana nao.

f) Pambanua sentensi ifuatayo kwa kielelezo cha Vishale. (alama 4)
Letu lililopaliliwa limetuletea mazao wengi.

g) Ainisha virai vyovyote vitatu. (alama 3)
Mwanafunzi yule mtoro hpenda kutembea katikati ya barabara kila wakati.

h) Tunga sentensi moja kutofautisha vitate vifuavyo: (alama 2)
i) Chaka

ii) Shaka

j) Andika sentensi ifuatayo katika wakati ujao, hali timilifu. (alama 2)
Mwanafunzi aliandika insha nzuri.

k) Andika sentensi hii katika udogo wingi. (alama 2)
Mtoto amefunga mlango wa nyumba yao.

l) Onyesha matumizi mawili ya alama ya vifungo katika sentensi. (alama 2)

m) Eleza maana ya kishazi. (alama 1)

n) Nyambua vitenzi vifuatavyo kama ulivyoelekezwa. (alama 2)
i) Suka (kauli ya kutendata)
ii) Pa (kauli ya kutendeka)

o) Onyesha yambwa na chagizo katika sentensi ifuatayo. Babu alijengewa nyumba kwa mawe na Juma. (alama 3)

p) Andika sentensi ifuatayo upya kwa kufuata maagizo uliyopewa.
Mzazi alishangilia matokeo ya mwana. (alama 2)
(Anza: Mwana . . . .)

q) Eleza maana mbili za sentensi ifuatayo.
Mama alinileta Kanga. (alama 2)

r) Yakinisha.
Usiponiita sitaandamana nawe. (alama 2)

s) Ainisha kitenzi katika sentensi ifuatayo. (alama 1)
Mgeni amewasili leo.

4. ISIMU JAMII.

1. Tofautisha kati ya uwili lugha na wingi lugha. (alama 4)

2. Taja sababu sita zinazosababisha watu kubadili na kuchanganya ndimi. (alama 6)

Mock Examinations
233/1
CHEMISTRY
Paper 1
Time: 2 Hours

1. A certain element A whose atomic number is 14 has 3 isotopes. The table below shows the mass number and relative abundance of each isotope.

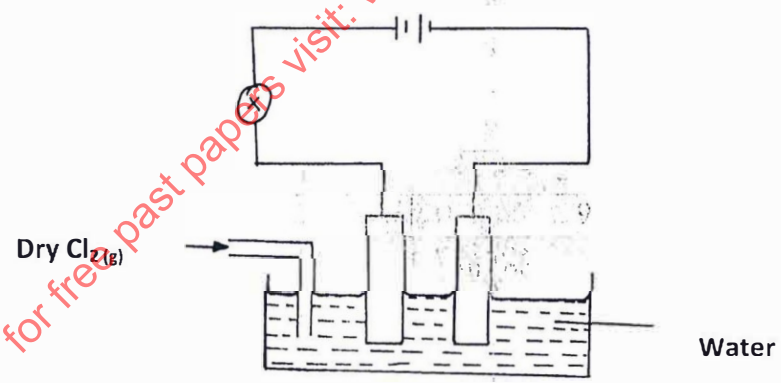
Isotopic mass	% abundance
28.0	92.2
29.0	4.7
30.0	3.1

Calculate the relative atomic mass of element A. (3 mks)

2. Some potassium chloride was found to be contaminated with copper (II) oxide. Describe how a sample of potassium chloride can be obtained from a mixture. (3 mks)

3. Calculate the oxidation number of;
(i) Chromium in $Cr_2O_7^{2-}$ (1 mk)
(ii) Sulphur in copper (II) sulphate ($CuSO_4$) (1 mk)

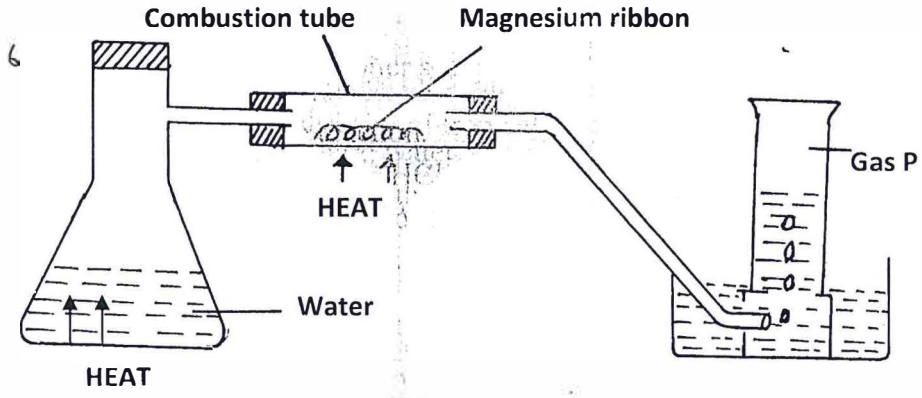
4. The set up below was made by a form four student. At the start of the experiment, the bulb did not light.



a) State and explain the observation made when $Cl_{2(g)}$ was bubbled in the water for about 10 minutes. (2 mks)
b) Write the chemical equation for the reaction which took place at the cathode. (1 mk)

5. Lead (II) sulphate can be prepared by double decomposition.
a) What is meant by double decomposition? (1 mk)
b) Starting with 0.1M sodium sulphate, describe how you would prepare lead (ii) sulphate. (2 mks)

6. Study the set up below and answer the questions that follow.



a) Explain why it is important to heat the water before heating the magnesium ribbon. (1 mk)

b) Name gas P. (1 mk)

c) Write a balanced equation for the reaction which takes place in the combustion tube. (1 mk)

7. Use the bond energies given below to answer the questions that follow.

Bond	Bong energy KJ /mole
C – H	414
Cl – Cl	244
C – Cl	326
H – Cl	431

a) Calculate the heat change for the reaction. (2 mks)

$CH_{4\,(g)} + Cl_{2\,(g)} \longrightarrow CH_3Cl_{\,(g)} + HCl_{(g)}$

b) State the condition necessary for the above reaction to occur. (1 mk)

8. The table below shows pH of 4 substances. Use it to answer the questions that follow.

Substance	pH value
F	11.5
G	6.0
H	2.5
I	7.0

a) Which part of the substances would produce the highest heat of reaction when reacted. Explain. (2 mks)

b) Identify the substance that is likely to be citric acid. (1 mk)

9. Fine the value of a and m in the nuclear equation below. (2 mks)

$^{a}_{m}X \longrightarrow {}^{208}_{82}Pb + 2\propto + 2\beta$

10. Boilers used for boiling hard water are normally covered with boiler scale after sometime.

a) What is the chemical name for the boiler scale? (1 mk)

b) How is the boiler scale removed? (1 mk)

c) State any one advantage of using hard water. (1 mk)

11. Nitrogen reacts with oxygen according to the equation

$N_{2\,(g)} + O_{2\,(g)} \rightleftharpoons 2NO_{\,(g)}, \Delta H = +197KJ/mole$

What is the effect of increase of the following on the position of the equilibrium? Explain. (2 mks)

(i) Pressure

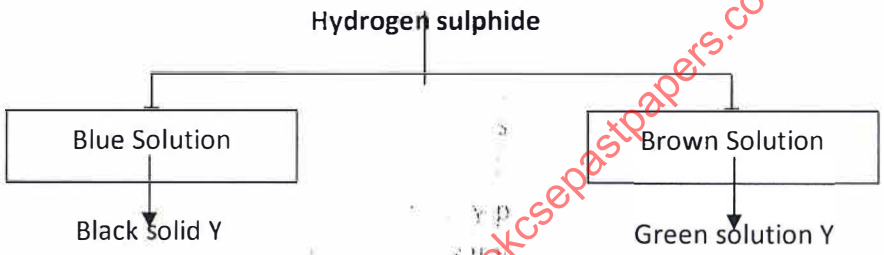
(ii) Temperature

12. The mass of $1dm^3$ of a gas at s.t.p. is 1.52g. What is the relative molecular mass of the gas? (1 mole of any gas occupies $22.4dm^3$ at s.t.p.) (2 mks)

13. In the manufacture of sodium carbonate by solvay process, ammoniated brine trickles down the carbonator while carbon (iv) oxide rises up the same tower.
    a) What is ammoniated brine? (½ mk)
    b) What is the main source of carbon (iv) oxide in the above process? (½ mk)
    c) Write two equations for the reactions in the carbonator (2 mks)
    I
    II

14. One mole of butane (C_4H_{10}) burns completely in oxygen and liberates 2877KJ.
    a) Write the equation for the combustion of butane. (1 mk)
    b) Draw an energy level diagram for the reaction. (2 mks)

15. Hydrogen sulphide was bubbled into solutions of metallic nitrates as represented in the flow chart below.



    a) Identify two solutions (2 mks)
        I. Blue solution
        II. Green solution
    b) Write the ionic equation for the formation of the black solid Y. (1 mk)

16. Define the following terms giving an example in each case. (3 mks)
    (i) Dative covalent bond
    (iii) Ionic bond

17. Combustion of 1.71g of an organic compound produces 2.64g of carbon (iv) oxide and 0.99g of water. Find the empirical formular of the compound. (3 mks)

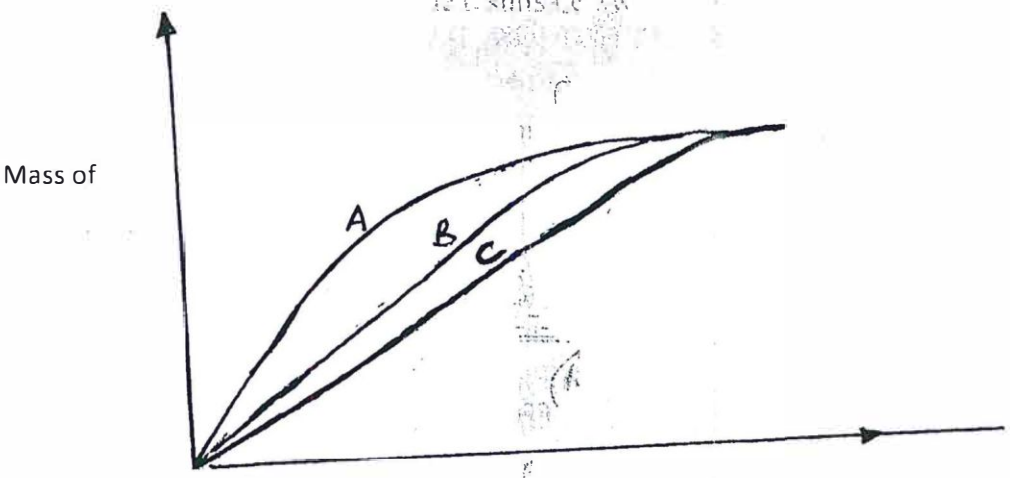
18. a) State Graham's law of diffusion. (1 mk)
    b) $100cm^3$ of sulphur (iv) oxide gas takes 20 seconds to diffuse through a porous plate. What volume of oxygen gas would diffuse through the same plate in 30 seconds, under similar conditions. (S = 32, O = 16) (2 mks)

19. This question concerns the alkaline earth metals (group 2) of the periodic table.

Element	Atomic radius (nm)	Ionic radius (nm)
Beryllium	0.112	0.030
Magnesium	0.160	0.065
Calcium	0.197	0.094
Strontium	0.215	0.110
Barium	0.221	0.134

    Account for the following
    a) Ionic radius is smaller than atomic radius for each element. (1 mk)
    b) Atomic radius increases from Beryllium to Barium (1 mk)
    c) The radius of K^+ ion is greater than that of Ca^{2+} ion although both ions have the same electronic configuration. (1 mk)

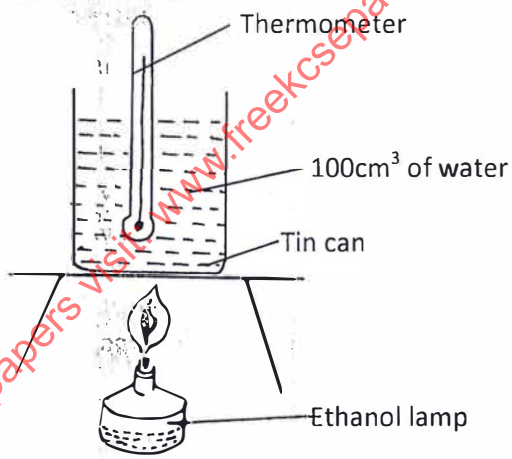
20. The figure below shows the result of an experiment during the reaction between marble chips and dilute hydrochloric acid. Large, small and fine powders were used.



Which curve represents the reaction with fine powder? Explain. (2 mks)

21. Below is a formular of a cleansing agent obtained from alkylalkanoic acid $CH_3 (CH_2)_{15} COONa$. Would this agent be suitable for washing clothes in water containing dissolved bleaching powder. ($CaOCl_2$)? Explain. (2 mks)

22. In an experiment to determine the molar heat of combustion of ethanol a student set up the following apparatus and obtained the results below.



Results

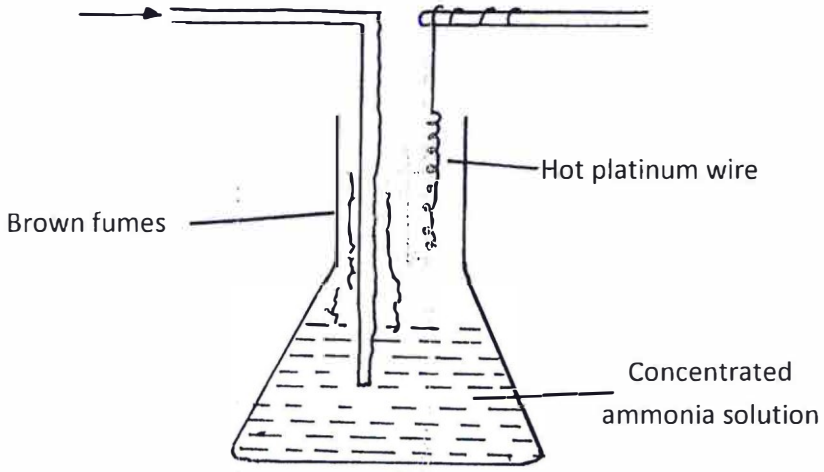
Volume of water heated	=	$100cm^3$
Initial mass of lamp + ethanol	=	4.9g
Final mass of lamp + ethanol	=	4.4g
Initial temperature of water	=	25^0C
Final temperature of water	=	45^0C
Specific heat capacity of water	=	4.2J/g/k

Use the results above to calculate the molar heat of combustion of ethanol.
(C = 12, H = 1, O = 16) density of water = $1g/cm^3$ (3 mks)

23. During the industrial manufacture of sulphuric acid, sulphur (IV) oxide is converted into sulphur (VI) oxide at one stage. State two factors which will quicken this process. (2mks)

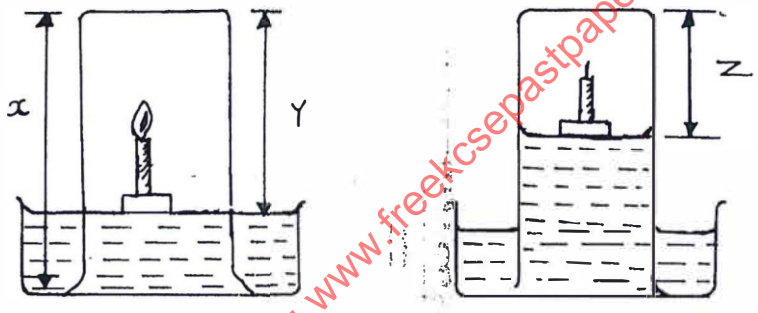
24. In an experiment to study the reaction between ammonia and air, a form three student set up the apparatus as shown below.

Dry oxygen



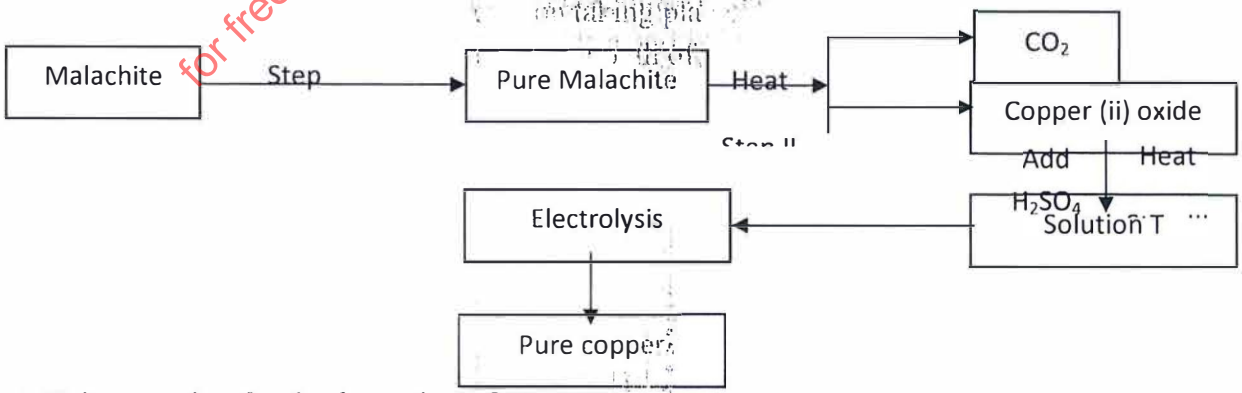
a) The platinum wire continues to glow without further heating. Explain. (1 mk)
b) Write down the equation for the reaction taking place. (1 mk)
c) Identify the brown fumes observed at the mouth of the conical flask. (1 mk)

25. A form one student set up the following apparatus to investigate the percentage of oxygen in air.



a) Write an experiment to show how the percentage can be calculated. (1 mk)
b) Why is NaOH preferred to water in the above experiment. (1 mk)

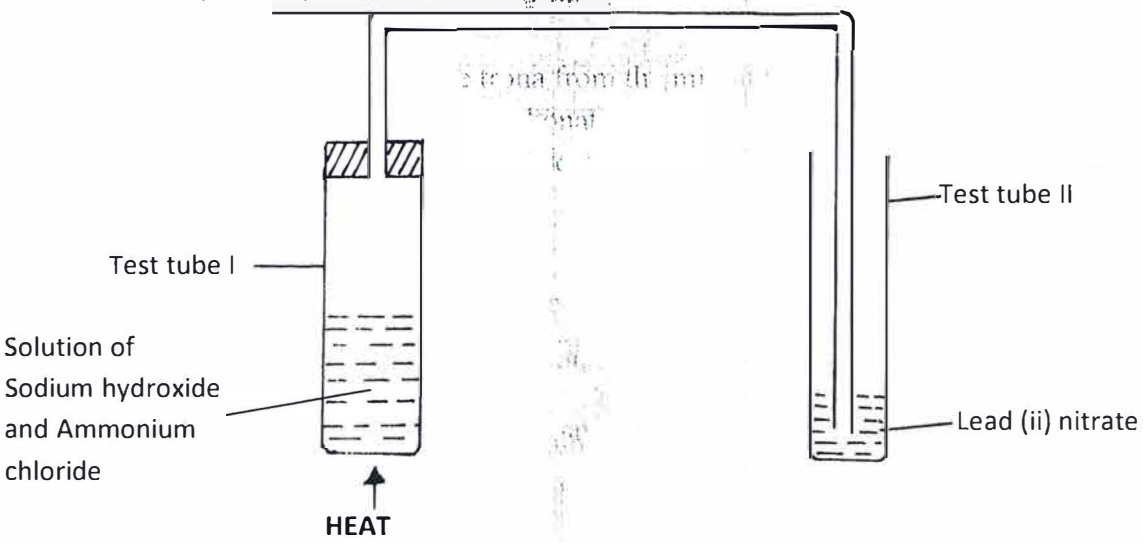
26. Malachite is one ore of copper. Extraction of copper from its ore occurs in three stages, purification, formation of electrolyte and finally electrolysis. The flow chart below shows the summary of the process.



a) Write equation for the formation of
(i) Solution T (1 mk)
(ii) Pure copper (1 mk)
b) Write down the equation for the decomposition of malachite in step II. (1 mk)

27. This question relates to the properties of group 7 elements in the periodic table.
a) Give an equation for the reaction between chlorine and aqueous bromide ions. (1 mk)
b) Explain briefly why chlorine is a stronger oxidizing agent than bromine. (2 mks)

28. A student set up the experiment shown below



a) State and explain the observation made in test – tube II. (2 mks)

b) Write a balanced equation for the reaction in test – tube I. (1 mk)

29. Sodium hydrogen carbonate is obtained from trona which is found combined with sodium chloride in the same lake in the Rift Valley.

a) State the method used to separate trona from the mixture with sodium chloride. (1 mk)

b) Give one use of sodium hydrogen carbonate. (1 mk)

30. A solution contains 11.5g of a solute in 50cm^3 of water. When the solution is cooled, crystals begin to appear at 20^{0}C. What is the solubility of the salt at 20^{0}C. (2 mks)

Mock Examinations

233/2

CHEMISTRY

Paper 2

THEORY

Time: 2 Hours

1. The grid below shows part of the periodic table. Use it to answer the questions that follow. (The letters are not the actual symbols of the elements)

						E	F	G
H	I		J	K	L	M	N	O
W	X							

a) Write the electronic configuration of the following elements. (1 mk)

E

M

b) Give the formula of one stable ion with an electron arrangement of 2:8 which is;

(i) Negatively charged (½ mk)

(ii) Positively charged (½ mk)

c) The oxide of J reacts with both hydrochloric acid and ammonium hydroxide to form a salt. What is the nature of the oxide. (1 mk)

d) Identify the most reactive non – metal. Giving a reason for your answer. (1 mk)

e) Explain the following observations in terms of structure and bonding:

(i) Element K has a higher boiling point than element N. (2 mks)

(ii) Ionic radius decreases from H to J. (1 mk)

f) (i) When a piece of element H is placed on water, it melts and a hissing sound is produced as it moves on the surface of the water. Explain these observations. (2 mks)

(ii) Write a chemical equation for the reaction between element H and water. (1 mk)

2. a) Sulphur is mined using the frasch process which uses superheated water at 170^0C and hot compressed air.

(i) Explain how water at 170^0C is obtained. (1 mk)

(ii) What is the role of superheated water. (1 mk)

(iii) State the role of compressed air. (1 mk)

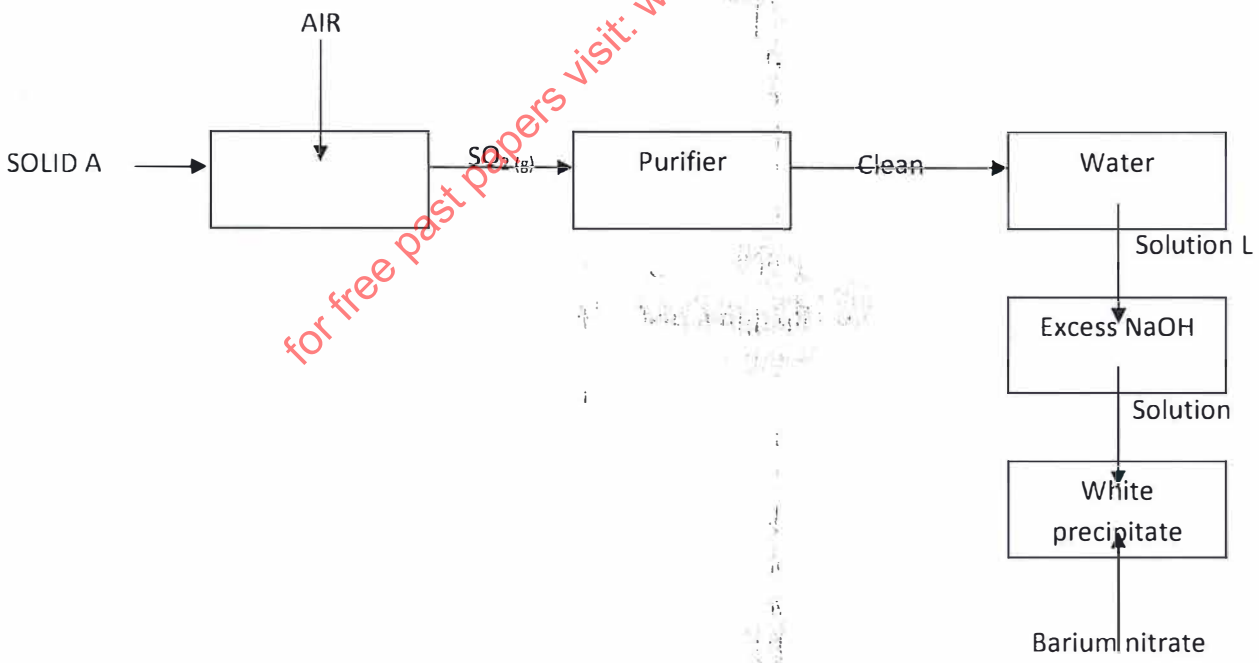
b) Give two large scale uses of sulphur. (1 mk)

c) In an experiment 3.6g sulphur were obtained by reacting hydrogen sulphide and sulphur (iv) oxide as shown in the equation below.

$$2H_2S_{(g)} + SO_{2\,(g)} \longrightarrow 2H_2O_{(l)} + 3S_{(s)}$$

Given that the yield of sulphur is 75%. Calculate the volume of sulphur (iv) oxide used at room temperature and pressure. (H = 1, S = 32, O = 16, molar gas volume at r.t.p. is 24dm^3) (3 mks)

d) Study the flow chart below and answer the questions that follow.



(i) Other than sulphur, name two possible identities of solid A. (1 mk)

(ii) Write an ionic equation for the formation of the white precipitate. (1 mk)

(iii) State and explain the observations made when red and blue litmus papers were dipped into solution L. (1 ½ mks)

(iv) State and explain the observations made when dilute hydrochloric acid is mixed with the white precipitate. (2 mks)

3. a) In an experiment to determine how the rate of reaction of hydrogen peroxide with potassium iodide varies with the concentration of hydrogen peroxide. The data in the table below was recorded.

Experiment		1	2	3	4	5
Beaker X	Hydrogen peroxide	30	25	20	15	10
	Water	0	5	10	15	20
Beaker Y	Potassium iodide	5	5	5	5	5
	2M Sulphuric (iv) acid	5	5	5	5	5
	Starch	2	2	2	2	2
	Time (T) (seconds)	54	63	82	103	164
	$\frac{1}{Time}$ (sec^{-1})					

Complete the table by computing $\frac{1}{Time}$ (2 ½ mks)

b) (i) Plot a graph of $\frac{1}{T}sec^{-1}$ (vertical axis) against volume of hydrogen peroxide used.(3 mks)

(ii) From the graph, determine the time the reaction would take if the volume of hydrogen peroxide is $28.5cm^3$. (2 mks)

(iii) How does the concentration of hydrogen peroxide affect its rate of reaction with potassium iodide. (1 mk)

(iv) Other than concentration, state two factors that would affect the rate of a reaction. (1 mk)

c) Given the equation below:

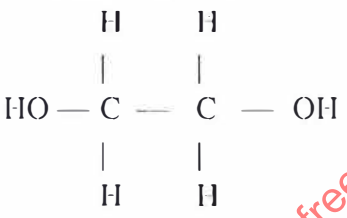
$Br_{2(aq)} + H_2O_{(l)} \rightleftharpoons OBr^-_{(aq)} + Br^-_{(aq)} + 2H^+_{(aq)}$

yellow – orange colourless

What is the effect of adding ethanoic acid to the above system in a chemical equilibrium.

1 ½ mks)

4. a) Ethan – 1, 2 – diol,



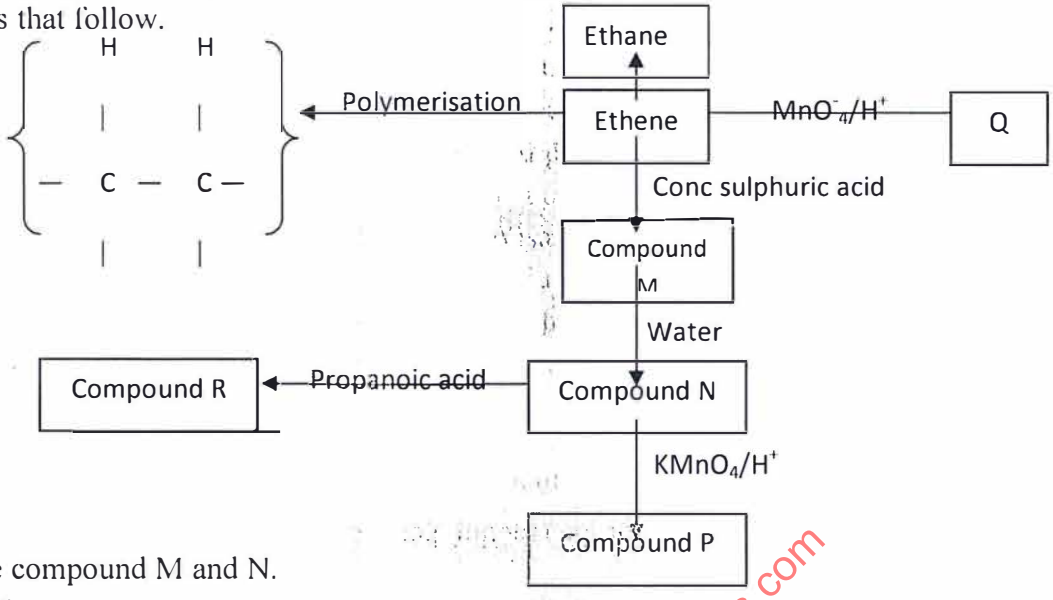
Polymerise under certain conditions with ethane dioic acid, HOOC – COOH.

(i) Name the type of polymerization. (1 mk)

(ii) Write the structural formula of the resulting polymer. (1 mk)

(iii) State one use of the polymer formed. (1 mk)

b) The flow chart below gives some reactions starting with ethene. Study it and answer the questions that follow.



(i) Name compound M and N.

M: (½ mk)

N: (½ mk)

(ii) Draw and name the structural formulae of P, Q and R (3 mks)

P:

Q:

R:

(iii) Write the equation for the complete combustion of compound N. (1 mk)

(iv) Name the reagents and conditions necessary for the formation of ethane from ethene

Reagents (½ mk)

Conditions (½ mk)

(v) Briefly explain how compound P and compound N can be distinguished chemically. (1 ½ mks)

(vi) If the polymer formed has a relative molecular mass of 8400. Calculate the value of n. (1 mk)

5. a) The table below gives the standard reduction potentials for a number of half cell reactions.

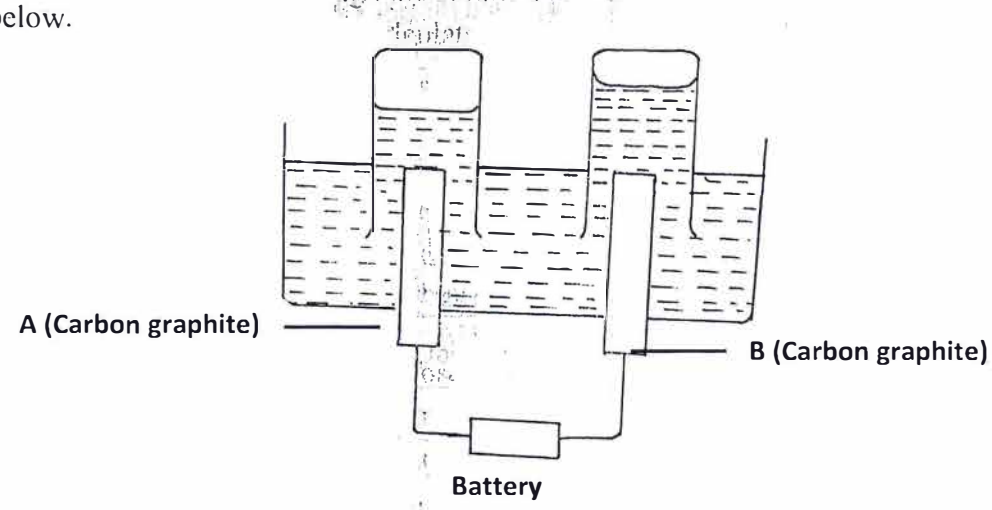
Half reactions	E^0 values (v)
$A^{2+}_{(aq)} + 2e^- \longrightarrow A_{(s)}$	- 2.37
$B^{2+}_{(aq)} + 2e^- \longrightarrow B_{(s)}$	- 1.18
$C^{2+}_{(aq)} + 2e^- \longrightarrow C_{(s)}$	- 0.402
$2D^+_{(aq)} + 2e^- \longrightarrow D_{2\,(g)}$	0.00
$E^+_{(aq)} + e^- \longrightarrow E_{(s)}$	+ 0.799
$F^{3+}_{(aq)} + 3e^- \longrightarrow F_{(s)}$	+ 1.50

(i) Identify the strongest reducing agent giving a reason for your answer. (1 mk)

(ii) The half cells of A and E were connected to form a cell. Draw a well labeled diagram of the electrochemical cell formed and calculate the e.m.f of the cell. (3 mks)

b) (i) Define electrolysis (1 mk)

(ii) An electric current was passed through dilute magnesium sulphate solution as shown in the diagram below.



I. Identify the anode and cathode (1 mk)

II. Write the half equations for the reactions taking place at A and B.

A: (1 mk)

B: (1 mk)

c) An electric current is passed through the solution for 15 minutes. The volume of the gas produced at the cathode is 447.6cm^3. Calculate the current used. (molar gas volume at rtp = 24000cm^3, 1 faraday = 96500 coulombs) (3 mks)

6. a) State Hess's law. (1 mk)

b) Use the following equations to determine the heat of formation of butane.

$C_{(s)} + O_{2\,(g)} \longrightarrow CO_{2\,(g)}$ $\Delta H = -393\ kJmol^{-1}$

$H_{2\,(g)} + \frac{1}{2}O_{2\,(g)} \longrightarrow H_2O_{(g)}$ $\Delta H = -286\ kJmol^{-1}$

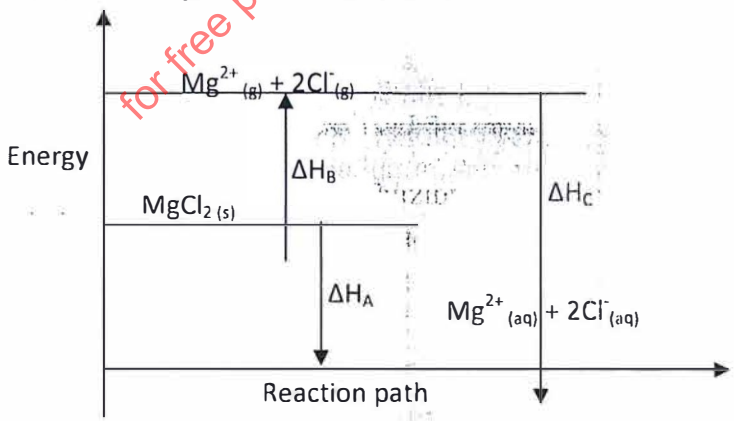
$C_4H_{10\,(g)} + {}^{13}/_2O_{2\,(g)} \longrightarrow 4CO_{2\,(g)} + 5H_2O_{(g)}$ $\Delta H = -2877\ kJmol^{-1}$

(i) Draw an energy cycle diagram for the formation of butane. (2 mks)

(ii) Calculate the heat of formation of butane. (1 mk)

c) Distinguish between hydration energy and lattice energy. (2 mks)

d) The diagram below shows an energy level diagram for the formation of magnesium chloride. Study it and answer the questions that follow.



(i) State the enthalpy changes represented by the letters A, B and C. (1 ½ mks)

(ii) What is the relationship between ΔH_A, ΔH_B and ΔH_C (½ mk)

(iii) Calculate the enthalpy change ΔH_A given that $\Delta H_B = 2484KJmol^{-1}$

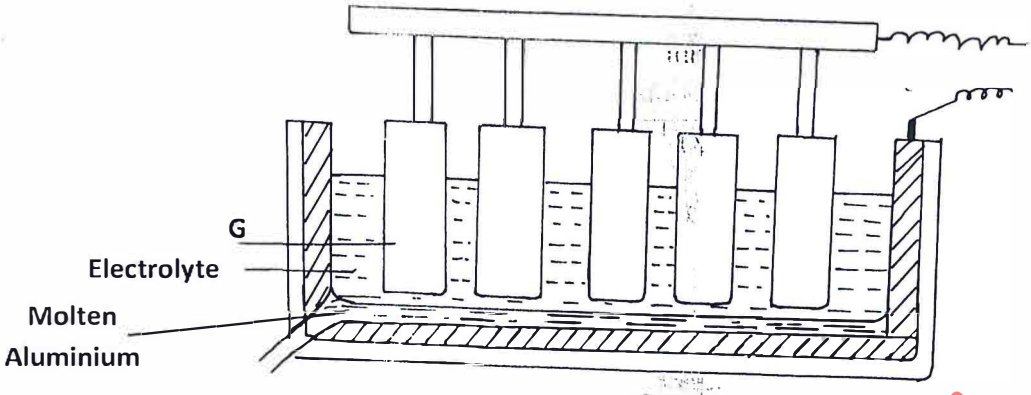
$\Delta H_C = -2659KJmol^{-1}$ (1 mk)

e) (i) Define heating value (1 mk)

(ii) State two factors that influence the choice of a fuel. (1 mk)

(iii) Give two reasons why wood and charcoal are chosen for domestic heating. (1 mk)

7. The diagram below illustrates the Hall's cell for the extraction of Aluminium. Study it and answer the questions that follow.



a) (i) Name the electrode labeled G. (½ mk)

(ii) Name the components of the electrolyte. (1 mk)

(iii) Write the chemical formula of the major component named in a) (i) above. (1 mk)

b) Electrolysis is carried at 800 – 900^{0}C and newly formed Aluminium is tapped off as a liquid. What does this indicate about the melting point of Aluminium? (1 mk)

c) (i) Give the ionic equations for the reaction that takes place at the cathode. (1 mk)

(ii) The anode has to be replaced frequently. Explain. (2 mks)

d) Electrolyte contains Na^+, Al^{3+}, O^{2-} and F^- ions. Explain why Na^+ and F^- ions are not discharged during the electrolysis. (2 mks)

e) A piece of unpolished aluminium foil is not attacked by water steam and dilute hydrochloric acid. Explain. (2 mks)

f) (i) The basic raw material for extraction of aluminium is bauxite. Name two major impurities in bauxite. (1 mk)

(ii) State one property of duralium that make it more suitable than pure aluminium in aeroplane construction. (½ mk)

Mock Examinations
233/3
CHEMISTRY
Paper 3
PRACTICAL

1. You are provided with:-

- 1.7g of sodium hydrogen carbonate, solid J.
- Solution F containing 71 grams per litre of a monobase acid, HA.
- 1.0M sodium hydroxide solution, solution G.

You are required to:-

i) Standardise the monobasic acid, HA

ii) Determine the formula mass of the anion A^-

iii) Determine the enthalpy change for the reaction between aqueous sodium hydroxide solution and excess carbon (iv) oxide.

PROCEDURE

I. Place six test tubes on a test tube rack. Using a $10cm^3$ measuring cylinder, measure $5cm^3$ portions of solution G and place them into each of the six test tubes.

By means of a burette, place $10cm^3$ of the monobasic acid, solution F in a $100cm^3$ beaker. Measure the temperature of this solution to the nearest 0.5^0C and record in table I.

Pour the first portion of the $5cm^3$ of solution G from the test tube into the beaker containing $10cm^3$ of solution F, stir the mixture carefully and record the highest temperature of the mixture in table I.

Pour the second portion of solution G immediately into the mixture in the beaker, stir carefully and record the highest temperature of this mixture in table I. Continue this procedure using the remaining portions of solution G to complete table I.

Table I

Total volume of G added (cm^3)	0	5	10	15	20	25	30
Volume of F (cm^3)	10	10	10	10	10	10	10
Temperature (^0C)							

(3mks)

a) On the grid provided, plot a graph of temperature versus volume of solution G added. (2 ½ mks)

Rise in temperature ΔT_1 (½ mk)

……^0C……

b) From the graph, determine the volume of solution G required to react with $10cm^3$ of solution F. (1 mk)

c) Calculate the number of moles of sodium hydroxide, solution G in the volume in b) above. (1 mk)

d) (i) Given that the equation for the reaction between sodium hydroxide and the acid HA is:-

$$NaOH_{(aq)} + HA_{(aq)} \longrightarrow NaA_{(aq)} + H_2O_{(l)}$$

Calculate the number of moles of the acid HA in $10cm^3$ of solution F. (1 mk)

(ii) Calculate the molar concentration of the monobasic acid HA. (1 mk)

(iii) Calculate the formula mass of the anion A^- (2 mks)

(H = 1)

e) Calculate the molar heat of neutralization of the sodium hydroxide, solution G, ΔH_1 using:-

$$\Delta H_1 = \frac{mass\ of\ solution \times 4.2 \times \Delta T_1}{mole\ \sin(c) \times 1000}$$ (2 mks)

Show the sign

II. By means of a burette, place $10.0cm^3$ of the acid HA, solution F in a $100cm^3$ beaker. Store gently and take the temperature of the acid at every half – minute. Record your readings in table II. At exactly 2 ½ minutes add all solid J to the acid, stir gently and continue taking the temperature every half minute to minute 5. Record your readings in table II.

Table II

Time (min)	0	½	1 ½	2	2 ½	3	3 ½	4	4 ½	5
Temp (^0C)										

(3 mks)

f) On the grid provided, plot a graph of temperature against time and determine from it the fall in temperature. (2 ½ mks)

Fall in temperature ΔT_2 (½ mk)

g) Calculate the molar heat for the reaction between sodium hydrogen carbonate and the monobasic acid HA, ΔH_2 from the following formula

$$\frac{\Delta H_2 = \text{mass of solution} \times 4.2 \times \Delta T_2}{\text{Mole sin (d)} \times 1000}$$

Show the sign (2 mks)

h) Determine the enthalpy change, ΔH_3 for the reaction represented by the equation.

$$NaOH_{(aq)} + CO_{2(g)} \longrightarrow NaHCO_{3(s)}$$

Use the following expression

$$\Delta H_3 = \Delta H_1 - \Delta H_2$$ (2 mks)

2. You are provided with liquid M. Carry out the tests below.

Record your observations and inferences in the spaces provided.

(i) To about $1cm^3$ of liquid M in a test tube add 2M sodium hydroxide solution dropwise until in excess. Keep the products for use in (iii).

Observations	Inferences
(1 mark)	1 mark)

(ii) To about $1cm^3$ of liquid M in a test tube add a few drops of 2M sulphuric acid.

Observations	Inferences
(½ mark)	(½ mark)

(iii) To the products in 2. (i) above, warm and test for any gas that is produced.

Observations	Inferences
(1 mark)	(1 mark)

(iv) To about $2cm^3$ of liquid M in a test tube, add about $2cm^3$ of 2M lead (ii) nitrate solution and warm.

Observations	Inferences
(1 mark)	(1 mark)

(v) To about $2cm^3$ of liquid M, add $2cm^3$ of dilute silver nitrate solution followed by excess dilute nitric acid.

Observations	Inferences
(1 mark)	(1 mark)

3. You are provided with solid H. Carry out the tests below. Record your observations and inferences in the spaces provided.

Dissolve the whole of solid H provided in about $10cm^3$ of distilled water and divide it into 4 portions in test tubes.

(i) To the first portion, add about $1cm^3$ of distilled water and shake thoroughly.

Observations	Inferences
(½ mark)	(½ mark)

(ii) To the second portion, add one drop of a universal indicator.

Observations	Inferences
(1 mark)	(1 mark)

(iii) To the third portion, add a small amount of solid sodium carbonate.

Observations	Inferences
(1 mark)	(1 mark)

(v) To the fourth portion, add $2cm^3$ of ethanol followed by 2 drops of 2M sulphuric acid. Warm gently then pour the resulting mixture into $100cm^3$ beaker containing $5cm^3$ of distilled water.

Observations	Inferences
(1 mark)	(1 mark)

Mock Examinations

233/3

CHEMISTRY
PRACTICAL
Paper 3

CONFIDENTIAL

- The information contained in this paper is to enable the head of the school and the teacher in charge of Chemistry to make adequate preparations for this year's chemistry mock practical examination. NO ONE ELSE should have access to this paper or acquire knowledge of its contents. Great care must be taken to ensure that the information herein does not reach the candidates either directly or indirectly.

- The Chemistry teacher SHOULD NOT perform any of the experiments in the same room as the candidates or make the results of the experiments available to the candidates or give any other information related to the experiments. Doing so will constitute an examination irregularity which is punishable.

Each candidate will require

1) Distilled water in a wash bottle
2) 1 boiling tube
3) Six test-tubes in a rack

4) About 1g solid sodium carbonate
5) 100cm^3 beaker
6) One pH chart paper range 1 to 14.
7) One test tube holder
8) Two blue and two red litmus papers
9) Spatula
10) 10cm^3 measuring cylinder
11) One burette
12) Thermometer
13) A stirring rod.
14) A stop watch / wall clock
15) 30cm^3 of solution F
16) 1.7g of powdered sodium hydrogen carbonate; solid J.
17) 40cm^3 of solution G.
18) 15cm^3 of solution m in a boiling tube.
19) About 0.5g of solid H.
20) A funnel.

STUDENTS SHOULD HAVE ACCESS TO

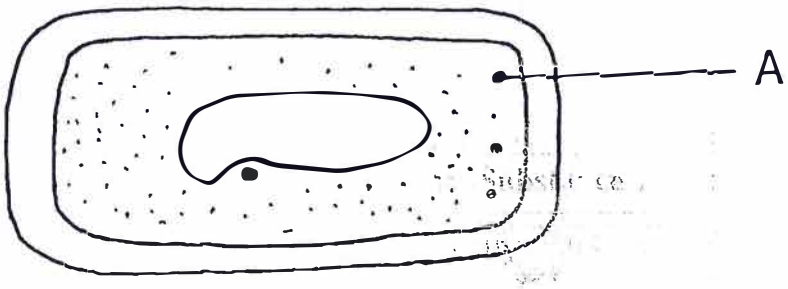
1) Source of Heat
2) 2M sulphuric acid supplied with a dropper
3) 2M sodium hydroxide solution supplied with a dropper
4) 2M lead (II) nitrate solution supplied with a dropper.
5) Universal indicator supplied with a dropper
6) 2M Nitric acid supplied with a dopper
7) 2M silver nitrate solution supplied with a dropper.

NOTE

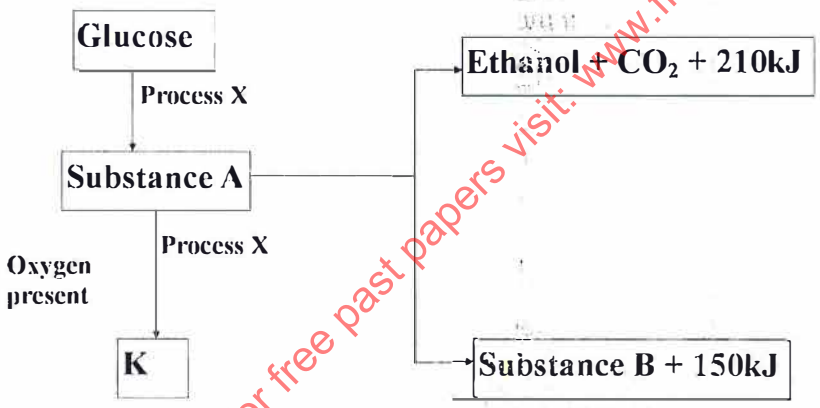
1) Solution F is prepared by dissolving 71 grams per litre of Hydrochloric acid (2M HCl)
2) Solution G is prepared by dissolving 40g per litre of sodium hydroxide. (1.0M NaOH)
3) Solution M is prepared by dissolving 200g of solid calcium chloride and 100g of solid ammonium chloride in a litre of solution.
4) Solid H is citric acid.

Mock Examinations
231/1
BIOLOGY
PAPER 1
Time: 2 Hours

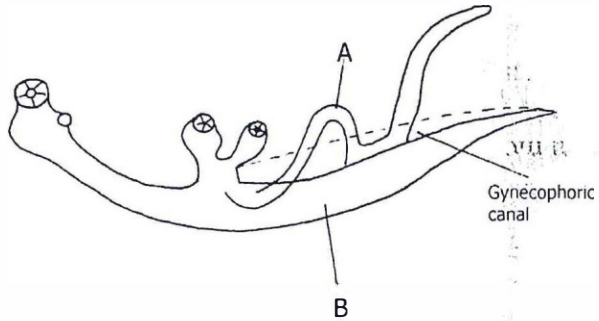
1. a) Name the antigens that determines human blood groups. (2mks)
   b) State the adaptation of the red blood cells that make them move in blood capillaries. (1mk)
2. The figure below is a diagram of a cell as seen under the light microscope (3mks)



State three structures that show that these is a plant cell. (3mks)
3. Why is it more advantageous to breath through the nose than through the mouth. (3mks)
4. State three characteristics of members of Bryophyta. (3mks)
5. State three characteristics of a population (3mks)
6. The diagram below represents a simple respiratory pathway in cells (2mks)



   a) Name the process marked X and Y (2mks)
   b) Name substances represented by K. (1mk)
   c) State the name of substance B. (1mk)
7. The diagram below shows two organisms of the same species (2mks)



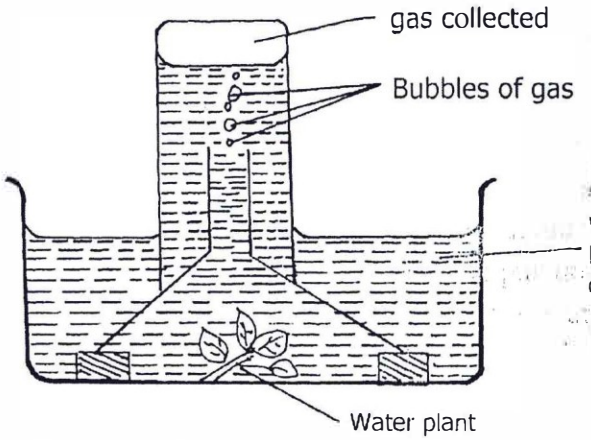
   a) State the sex of organism A and B. (2mks

b) Name the disease caused by the above organism. (1mk)

8. Identify the physiolocal process involved in the following

a) Feeding in venus fly trap(insectivorous plant) (1mk)
b) Absorption of mineral salts by plant roots. (1mk)

9. An experiment on photosynthesis was set up as shown below (4mks)



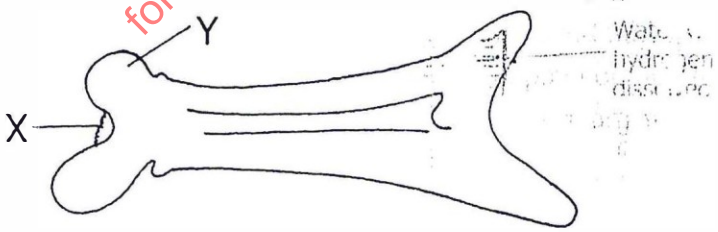
a) What was the aim of this experiment. (1mk)

b) What gas is produced during this experiment. (1mk)

c) Why was sodium hydrogen carbonate added to water during this experiment. (1mk)

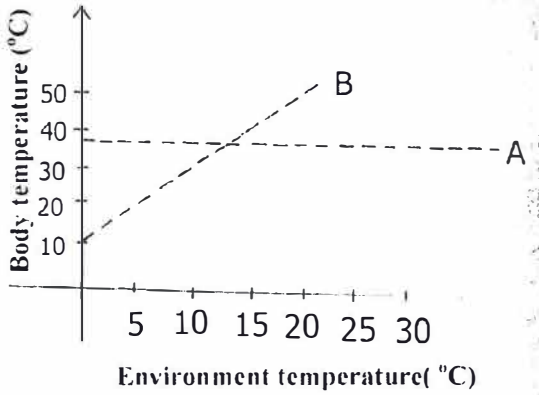
10. Distinguish between the following
a) Habitat and ecological niche. (2mks)
b) Intraspecific and interspecific competition . (2mks)

11. The diagram below represents a mammalian bone. (1mk)



i) Name the bone (1mk)
ii) Identify the part labelled X (1mk)
iii) Name the bone that articulates with the part labelled Y (1mk)

12. Body temperature of two animals A and B were taken over the increase in environmental temperature. The results are shown in the diagram below.



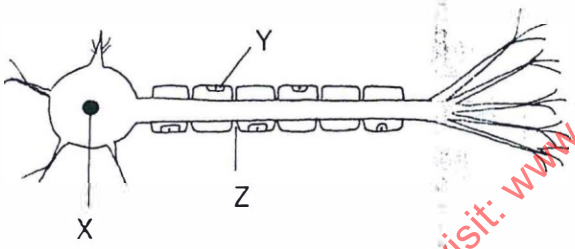
a) What name is used to describe group of animals represented by
A..... (1mk)
B..... (1mk)

b) State two advantages of the group of animals represent by A over that of B. (2mks)

13. Briefly explain how the following affect the rate of transpiration (2mks)

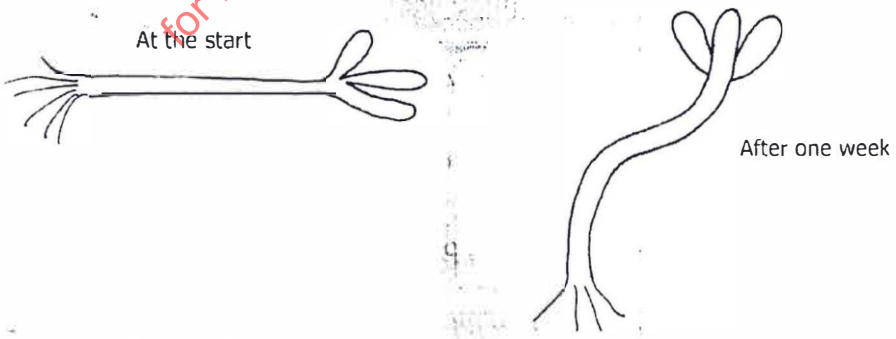
i) Sunken stomata (2mks)
ii) Hairy leaves (2mks)

14. The diagram below shows the structure of a neurone



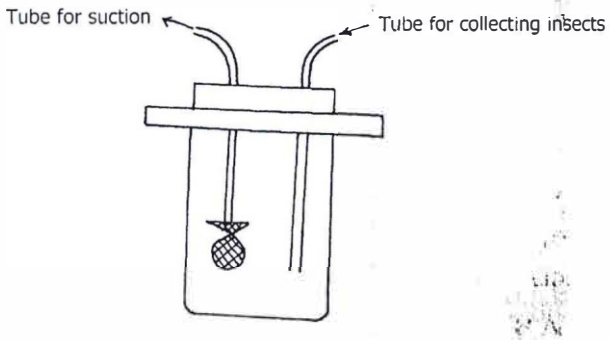
i) a) Identify the type of neurone drawn above (1mk)
b) Name the parts labelled X and Y

15. A form four girl uprooted a young plant and laid it horizontally on the ground. After one week it was observed that the shoot of the same plant had bend upwards while theroot downwards as shown below.



Account for the observations made. (3mks)

16. The diagram below shows on apparatus used in collection of specimen



c) Identify the apparatus (1mk)

d) State its use (1mk)

17. Give a reason why staining is necessary when preparing specimen for observation under a microscope. (1mk)

18. The scientific name for a domestic cat is ***felis catus***. Outline the rules that were never followed in writing the name (3mks)

19. An organelle magnified 6000 times by an electrons microscope, measured 3mm in diameter. Calculate its real diameter in micro metres.
Show your working (2mks)

20. What happens when a young herbaceous plant is well watered with strong salt solution. (2mks)

21 Name the cell organelles that would be found in abundance in

a) Skeletal muscus (1mk)

b) Palisade cells (1mk)

22. State one role of the following elements in the human body. (1mk)

a) Iron (1mk)

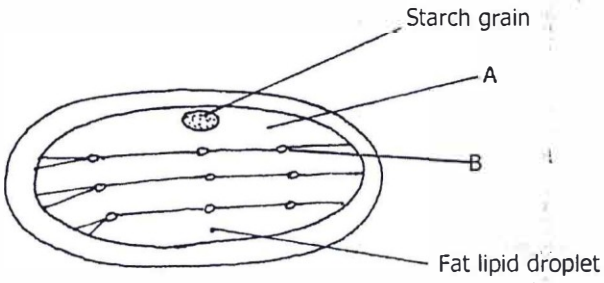
b) Chlorine (1mk)

23. a) What is mean by the term assimilation. (1mk)

b) State two ways in which end products of lipids digestion are assimilated. (2mks)

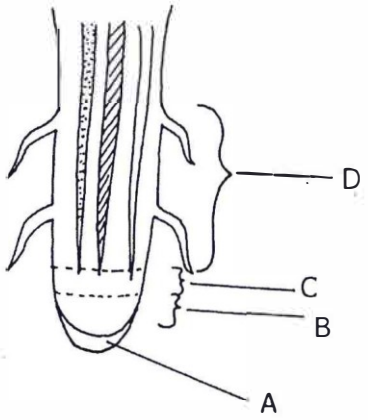
24. Enzyme + substrate ⟶ enzyme + products from the above equation name two properties of enzymes exhibited in the equation. (2mks)

25. Study the diagram below and answer the questions that follow (2mks)



What process takes places in A and B. (2mks)

26. The diagram below represents a section of the dicot root apex. (2mks)



a) State the role of the part marked A (1mk)

b) State three characteristics of the cells found in region B. (3mks)

27. Give two adaptations of spiracles to their functions. (2mks)

28. Differentiate between lactic acid fermentation and alcoholic fermentation. (2mks)

29. State two importance of the placenta during pregnancy (2mks)

30. State one function of water in a germinating seed. (1mk)

31. Explain the following terms

a) Test cross (1mk)

b) Phenotype (1mk)

32. Haemophilia is a sex – linked disorder caused by a recessive gene located on the X – chromosome. Give the genotype of a make haemophiliac individual. (1mk)

33. Distinguish between divergent and convergent evolution. (2mks)

Mock Examinations

231/2

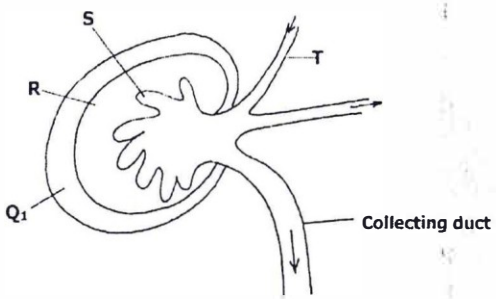
BIOLOGY

PAPER 2

Time: 2 Hours

SECTION

1. The diagram below is a longitudinal section of an organ in mammals



a) Name the organ (1mk)

b) Identify the parts R and S (2mks)

End

c) i) State two differences in the structure above found in the deserted- rat and fish (3mks)

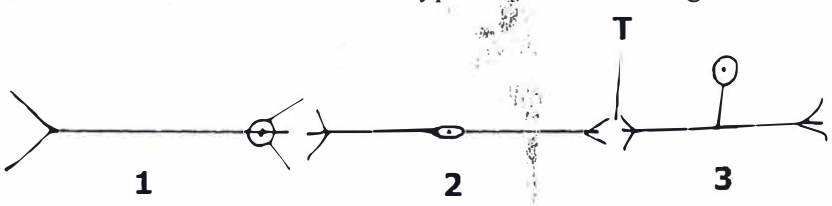
ii) Account for the difference stated above. (2mks)

d) Name the gland associated with the secretion of aldorsterone hormone. (1mk)

2. a) What is the economic importance of anaerobic respiration in industry. (3mks)

b) Explain what happens in the two phases of aerobic respiration. (5mks)

3. The diagram below shows three different types of neurons along a reflex arc.



a) Identify the Neuron labeled 1,2 and 3. (3mks)

b) Using arrows show the direction of impulse transmission on the diagram. (1mk)

c) Name the part where the cell body of neurons 1 and 2 are located. (2mks)

d) Describe the transmission of impulses across the part labeled T.

4. In an experiment, a variety of garden peas have a smooth seed coat was crossed with a variety with a wrinkled seed coat. All the seeds obtained in the F_1, had a smooth seed coat
The F_1 generation was selfed. The total number of F_2 generation was 7324.

a) Using appropriate letter symbols in a punnet square, work out the genotypes of the F1 generation. (4mks)

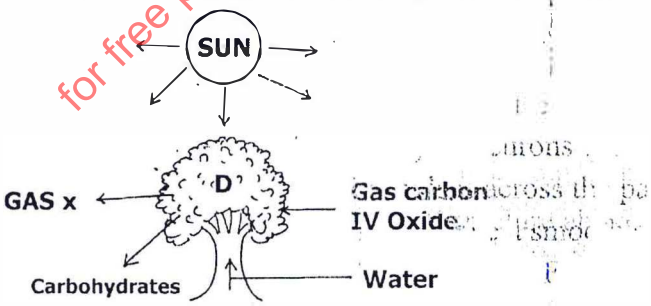
b) From the information above, work out the following for the F_2 generation

(i) Genotypic ratio (2mks)

(ii) Phenotypic ratio (1mk)

(iii) Wrinkled number (1mk)

5. The diagram below illustrate the first stage in the energy flow in the ecosystem



a) Identify (i) organelles responsible for activity in D.

(i) in D (1mk)

(ii) Gas X (1mk)

b) Suggest the roles played by each of the following in the process illustrated above.

i) Light energy (1mk)

ii) Water (1mk)

iii) Carbon (II) oxide (1mk)

c) Give three ways in which the carbohydrates produced in the organelles at D is utilized in the plants. (3mks)

SECTION B: 40 MARKS

6. The following data are results from an observation and measurement of daily growth in an organism over a period of 24 days of its development

a) Using a suitable scale draw graphs of width of head and length of femur against time on the same axis. (8mks)

DAY	WIDTH OF HEAD	LENGHT
	Mm	Femur (mm)
1	3.0	7.0
2	3.5	7.5
3	4.0	8.0
4	4.0	8.0
5	4.0	8.0
6	4.0	9.2
7	4.0	10.5
8	4.0	12.0
9	4.7	12.0
10	5.0	12.0
11	5.0	12.0
12	5.0	12.0
13	5.0	12.0
14	5.0	12.0
15	5.0	13.3
16	5.0	14.8
17	5.7	16.4
18	6.4	18.0
19	7.0	18.0
20	7.6	18.0
21	7.6	18.0
22	7.6	18.0
23	7.6	18.0
24.	7.6	18.0

b) i) Name the growth pattern represented by the graph. (1mk)

ii) With reference to your graph, identify the phylum to which the organism belongs. Give reasons for your answer. (2mks)

c) Account for the length of hind femur between

(i) day 3 and day 7 (2mks)

(ii) day 7 and day 10 (2mks)

d) State two hormones involved in the growth pattern represented by the graphs . (2mks)

c) State two advantages of metamorphosis in organisms. (2mks)

7. Explain how the various activities of man have caused air pollution. (20mks)

8. a) What are enzymes? (2mks)

b) State the properties of enzymes (6mks)

c) Discuss the factors that affect the rate of enzyme – catalysed reactions (12mks)

Examinations
231/3
BIOLOGY
PAPER 3
PRACTICAL

1. Label test tubes J K L M. Measure 5ml of the Hydrogenperixode provided and pour into each test tube. Peel specimen N provided and obtain four cube of about 1cm^3. Grind one of the cubes put in test tubes J add water and boil for about 5 minutes. Grind other two cubes place them in test tube K and M respectively. The remaining cube put it in L.

a) Record the observation in (1mk

J……..

K……

L……..

M……..

b) Compare the observations made in (2mks)

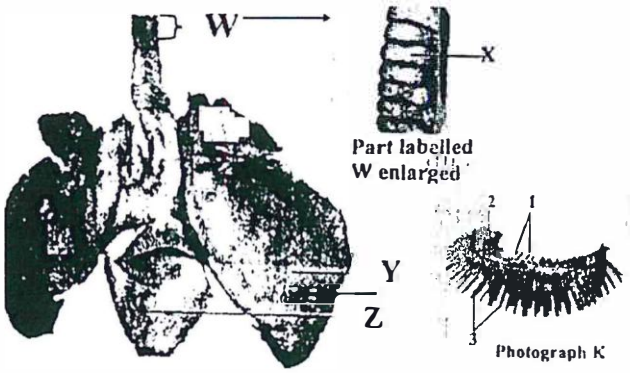
(i) K and J

ii) K and M (2mks)

c) Account for your answer in b(i) (ii) (4mks)

d) Write a word equation for the reaction taking place in tube M. (2mks)

2. Below are photographs labelled J and K of organs obtained from different animals.The organs perform similar functions.



Photograph J

a) Identify the organs (2mks)

J……..

K……..

b) State the functions performed by the organs. (2mks)

c) Name the parts labelled X Y and Z in photograph. (3mks)

d) i) Identify the parts labelled 1,2 and 3 in photograph K. (3mks)

ii) Using observable features state how the parts labelled 1 and 3 you identified in (d)(i) above are adapted to their functions. (4mks)

1……..

3……..

3. Below are diagrams of specimens J K and L that have been obtained from different regions of the same mammalian body. Examine them.

K

a) i) Identify the diagrams

J ……..

K ……..

L ……..

ii) State one functions for each of the diagrams

J ……..

K ……..

L .....

b) i) State two adaptations of L to its function in above. (2mks)

ii) Name the structure that fits into the large opening of J, K and L (1mk)

c) Name three features that difference late specimen L from specimen J and K. (3mks)

Mock Examinations
231/1
BIOLOGY
PRACTICAL

CONFIDENTIAL

Provide each candidate with

1. Hydrogen peroxide – 20 ml
2. Test tubes - 4
3. Irish potatoes -2
4. Scalpel -1
5. Source of heat
6. Adhesive labels -5
7. Distilled water
8. Pestle and mortar
9. Tissue paper
10. Measuring cylinders 10ml

PREPARATION OF SOLUTIONS
Mix equal volumes of egg albumen, glucose, starch, ascorbic acid and water to make a solution

Mock Examinations
232/1
PHYSICS
PAPER 1
TIME: 2 HOURS

SECTION A (25 MARKS)
Answer ALL the question in this section

1. State the kinetic theory of matter (1mk)
2. The mass of a densite bottle of volume 50cm^3 is 15.0g when empty.Aluminium turnings are poured into the bottle and the total mass is 65.0g.Water is then added into the turnings till the bottle is full. If the total mass of the bottle and its content is 95.0g.Calculate the densite of the aluminium turnings. (4mks)
(If density of water is 1000kg/m^3)

3. Explain why trucks which carry heavy loads have many wheels. (1mk)
4. State two ways of improving surface tension (2mks)
5. Figure 1 below represents a simple fire alarm. Explain how it works (3mks)

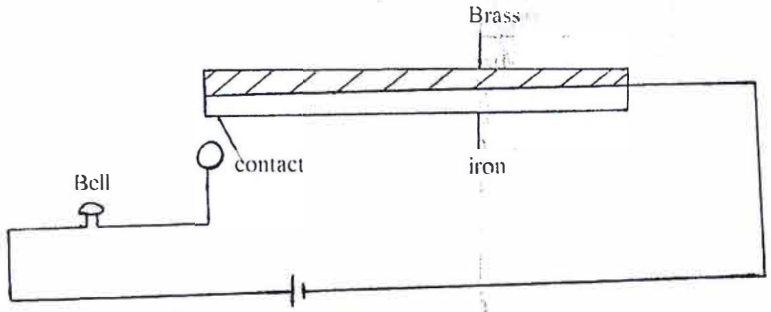


Figure 1

6. Explain why a wire a gauze is placed below a beaker while heating water in it (1mk)
7. Figure 2 below shows alight rod balanced due to the action of the forces shown

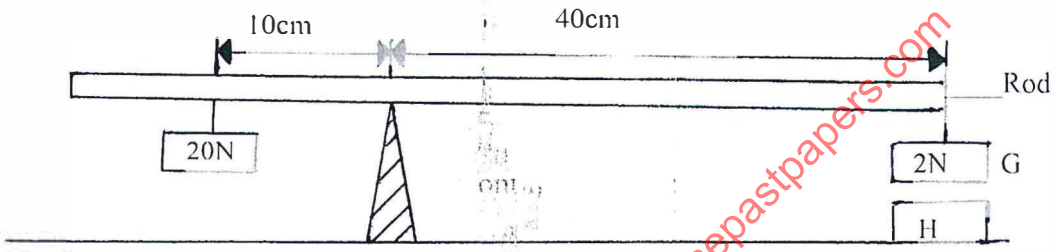


Figure 2

G is a magnet of weight 2N and it is a permanent magnet which is fixed. Determine the force between G and H, stating whether it is attractive or repulsive (3mks)

8. State Hooke's law (1mk)
9. Figure 3 below shows a burning weight edtripless candle floating upright in water

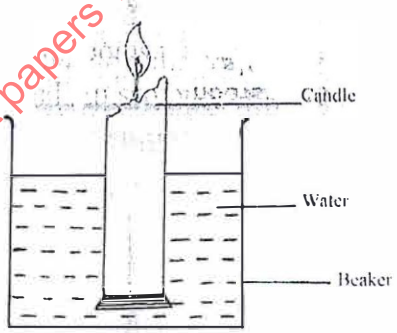


Figure 3

Explain what happens to the candle as it continues to burn (2mks)

10. State Bernondi's principle (1mk)
11. Figure 4 below represents apart of a tape pulled through a tisker-timer is 50Hz, calculate the acceleration of the trolley (3mks)

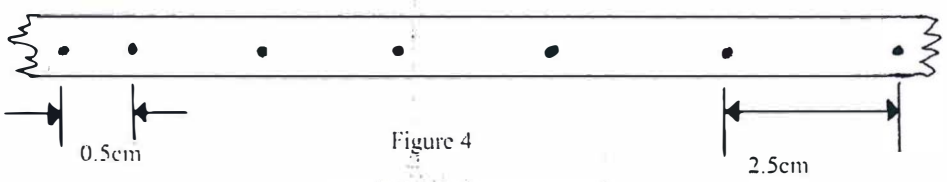


Figure 4

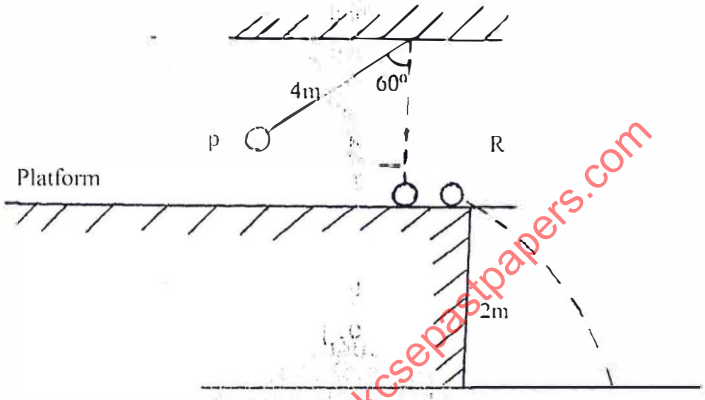
12. A fixed mass of gas occupying 4 litres at 27^0c is compressed at constant temperature until the pressure is doubled. It is then cooled at constant pressure until the volume is 1 litre. What is the final temperature of the gas. (3mks)

SECTION B (55MKS)

Answer ALL the questions in this section

13. (a) Define the term inertia (1mk)

(b) A body P of mass 4kg supported by alight inextensible string 4m long, is held at an angle of 60^0 from the vertical position as shown in figure 5 below.
A second body R of mass 4kg rests at the edge of a platform 2m high, the body is released and strikes body R head-on in a perfectly elastic collision.



(i) Explain the term elastic collision (1mk)

(ii) Determine how long it takes after P is released for body R to strike the ground (4mks)

(iii) How far from the base of the platform will body R strike the ground if P stops after the collision (3mks)

(c) A parachutist allows his leg to bend and roll over on the ground when he lands. Explain (2mks)

14. (a) Efficiency of a machine can never be 100% .Explain (2mks)

(b) A man uses the inclined plane to lift a 50kg load through a vertical height of 4.0m.The inclined plane makes an angle of 30^0 with the horizontal .If the efficiency of the inclined plane is 80%.
Calculate

(i) The effort needed to move the load up the inclined plane at a constant velocity (3mks)

(ii) The work done against friction in raising the load through the height of 4.0m(Take g=10N/kg) (3mks)

15. (a) You are provided with the following apparatus
- A filter funnel
- A thermometer
- A stop watch
- A beaker
- A stand, boss and clamp
- A weighing machine
- Ice at 0^0c
- An immersion heated rated P watts

Describe an experiment to determine the specific latent heat of fusion of ice,clearly stating the measurements to be made. (4mks)

(b) 200g of ice 0^0c is added to 400g water in a well lagged calorimeter of mass 40g.The initial temperature of the water was 40^0c.If the final temperature of the mixture is x^0c, (specific latent heat of fusion,Lf=3.36×10^5Jkg^{-1}, specific heat capacity of water,c=4200Jkg^{-1}k^{-1}, specific heat capacity of copper =400Jkg^{-1}k^{-1})

(i) derive an expression for the amount of heat gained by ice to melt it and raise its temperature to x^0c (2mks)

(ii) derive an expression for the amount of heat lost by the calorimeter and its content when their temperature fall to x^oc (2mks)

(iii) Determine the value of x (3mks)

(c) Ether is put into a beaker which is placed on a thin film of water. A student blows the ether through a pipe continuously, state and explain the observation made after some time. (2mks)

16. (a) A body is uniform circular motion experience acceleration despite having constant velocity. Explain (2mks)

(b) A car travelling with uniform speed on a level circular path is likely to experience skidding. Explain (2mks)

(c) Figure 6 below shows a 40g wooden block being in a horizontal circular path of radius 20cm.If it takes 0.5 seconds to describe an arc length of 12cm.

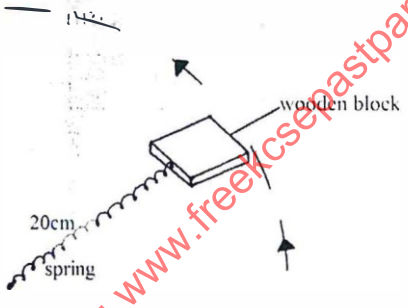


Figure 6

(i) Identify the forces acting on the wooden block (2mks)

(ii) Determine the linear velocity of the block (2mks)

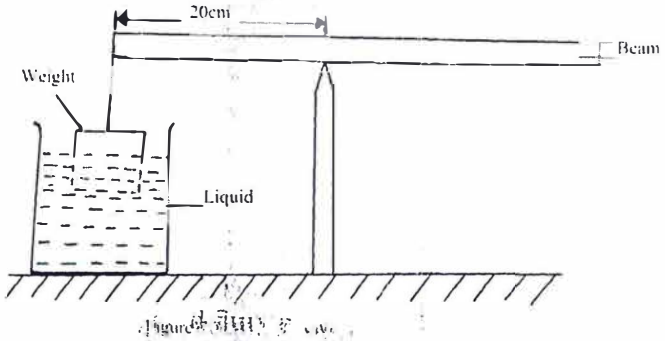
(iii) Determine the centripetal force (2mks)

17. (a) A piece of scaling way weights 3N in air and 0.22N when immersed in water.Calculate

(i) Its relative denate (2mks)

(ii) Apparent weight in a liquid of density 800kg/m^3 (2mks)

(b) Figure 7 below shows a uniform beam one meter long and weighing 2N kept in horizontal position by a body of weight 5N immersed in a liquid:-



Determine the upthrust on the load (3mks)

(c) Figure 8 below shows a wooden block of dimensions 60cm by 40cm by 30cm held in position by a string attached to the bottom of a swimming pool. The density of water is 1000kg/m^3.

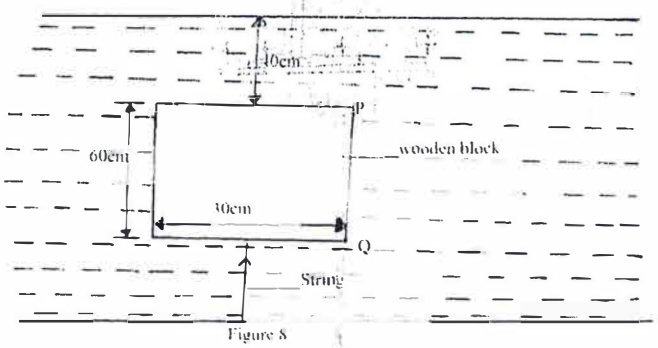


Figure 8

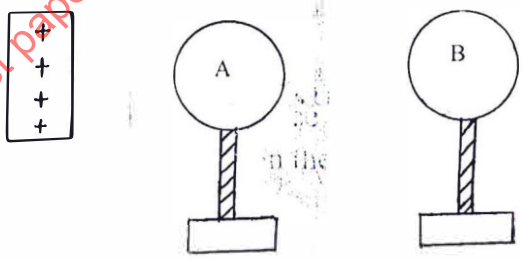
(i) Calculate the pressure at the bottom surface of the block (3mks)

(ii) Draw graph to show how the pressure on the block changes between P and Q (2mks)

Mock Examinations
232/2
PHYSICS
PAPER 2
TIME: 2 HOURS

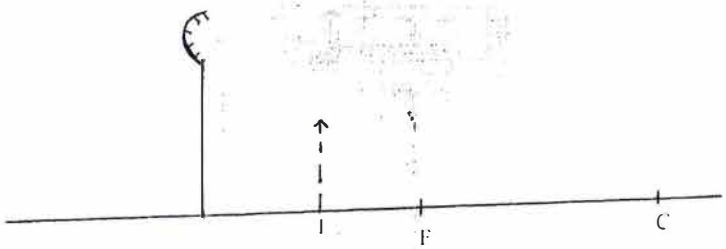
SECTION A (25 MARKS)

1. A positively charged rod is brought close to two spheres A and B, held by insulating handles as shown below.

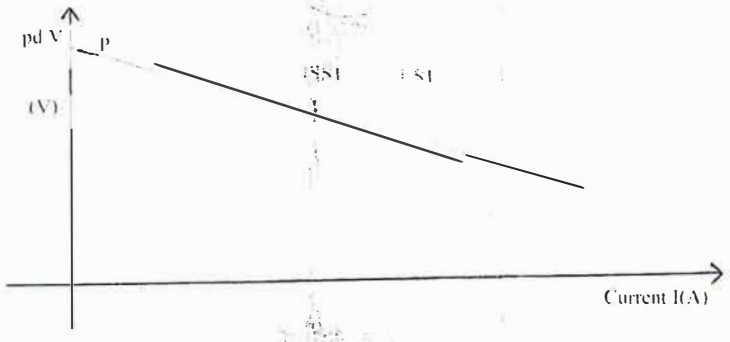


Indicate the charge on A and B (2mks)

2. The diagram below show the image formed by a convex mirror. Complete the diagram to show the position of the image

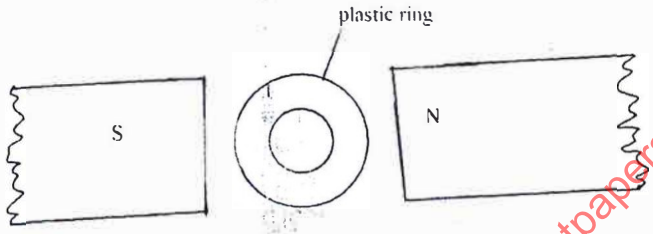


3. The sketch below shows the pd across a cell for various values of current through a resistance wire.

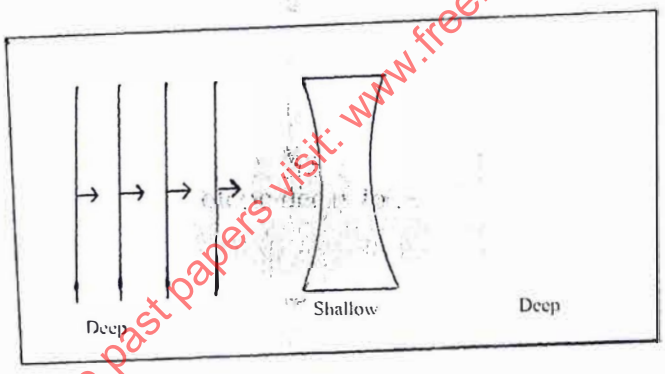


State and explain the significance of P (2mks)

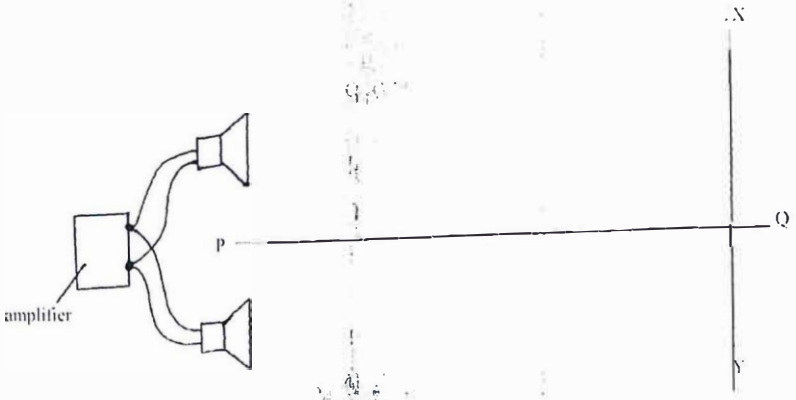
4. The figure below show two pole of a magnet and ring of plastic placed between them. Show the magnetic line of force between them (1mk)



5. The diagram below shows plane waves passing through a medium. The waves encounter a concave shallow region. Complete the diagram to show the nature of the waves after posing through the shallow region (2mks)



6. Two loudspeakers are connected so the output of an amplifies and arranged as shown below.



(c) A mass mg of radioactive isotope decay to 50g in 100 days. The half life of the isotope is 25days.

Calculate the initial mass of the isotope (2mks)

Give the numerical values of r,s

$$^{210}_{84}Pc \longrightarrow {}^{206}_{82}Pb + {}^{r}_{s}X + Energy$$

r _____ (1mk)

s _____ (1mk)

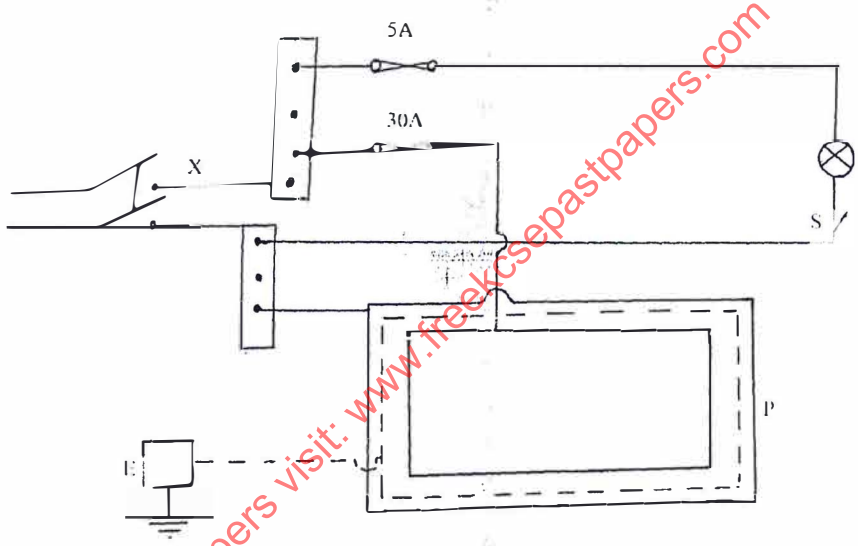
State the lined of energy given out in the process (1mk)

Two observers A and B, walk along the lines PQ and XY respectively. State and explain the observations made by:

Observation A (2mks)

Observation B (2mks)

7. The diagram shows part of a domestic wiring system



(i) State the parts a labelled in the circuit

X.....

p of the whole circuit

(ii) Identify the mistake in the wiring

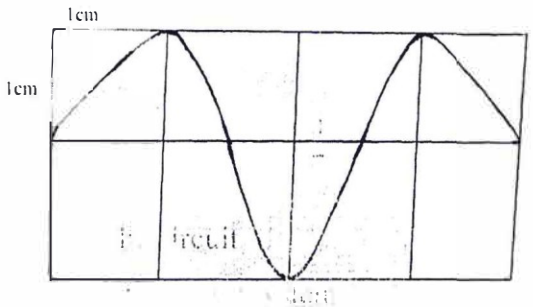
8. An electrical heating device is rated 1.5KW, 240V.What is the meaning of the rating? (1mk)

How much energy does it consume in a month if it is operated for 5 minutes daily? (3mks)

9. Uv rays are incident on a surface of a clean polished zinc plate. What is the effect of increasing the distance between the zinc plate as the uv source? (1mk)

10. State and explain the effect of increasing the filament current in an x-ray tube (2mks)

11. The figure below shows the trace of a signal on a CRO

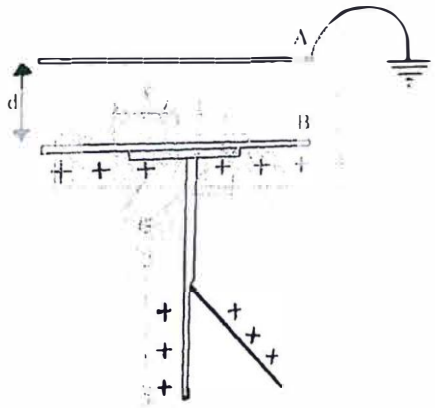


Given that the time base is set at 100ms/div, determine the frequency of the signal (2mks)

SECTION B (55 MKS)

12. (a) Define capacitance of a capacitor (1mk)

The figure below shows a charged electroscope two aluminium plates A and B arranged a shown



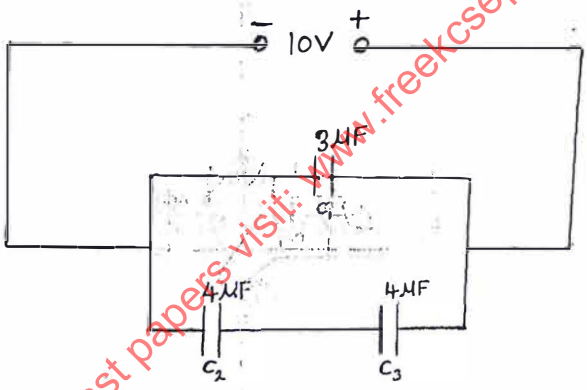
State and explain the observations made when:

(i) d is reduced (2mks)

(ii) the plate A is more horizontally (2mks)

(iii) a sheet of polythene is placed between A and B (2mks)

(b) Three capacitors are connected to a 10V battery as shown below.

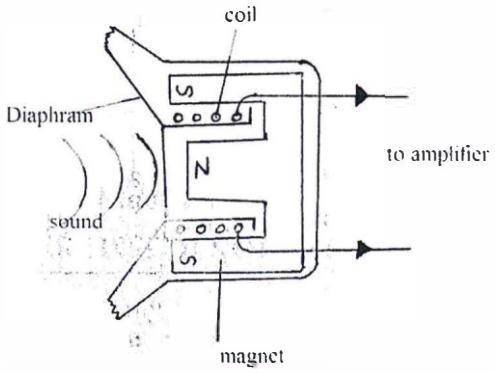


(i) Calculate the combined capacitance (3mks)

(ii) What is the charge on the 3 μ F capacitor (3mks)

13. (a) State Len's law of electromagnetic induction (1mk)

(b) The figure below shows a simple microphone in which sound warn from a person talking cause the diaphram to vibrate.



(i) Explain how a velocity current is induced in the coil when the diaphram vibrates (3mks)

(ii) State two way in which the induced current in (i) above can be increased (2mks)

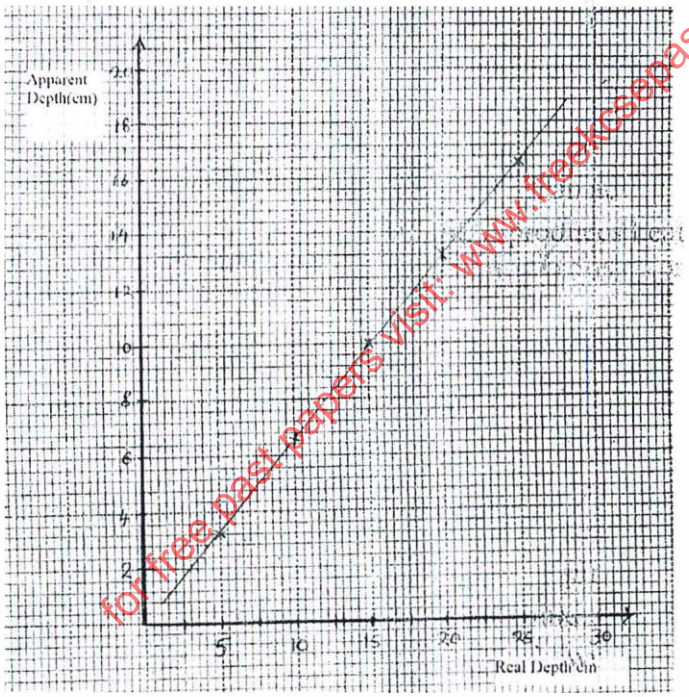
(c) A transformer with 1200 turns in the primary coil and 120 turns in the secondary coil has 400v applied to its primary circuit, from an ac source.It is found that when a heater is connected to the secondary circuit, it produces heat at the rate of 600W.Assuming 100% efficiency ,determine the

(i) Voltage in the secondary circuit (3mks)

(ii) the current in the primary circuit (3mks)

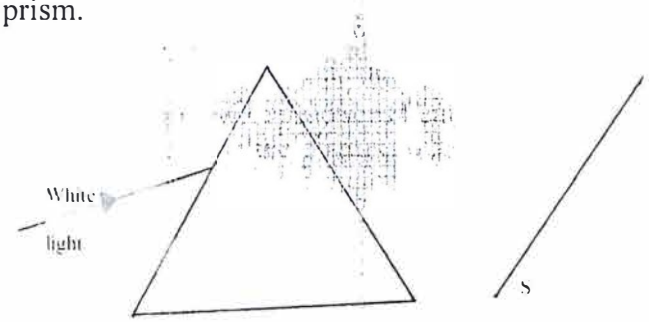
14. (a) Define the refractive index of a substance (1mk)

(b) In an experiment to determine the refractive index of a liquid the liquid was poured into a measuring cylinder. A pin was placed at the bottom of the cylinder and another pin was used to locate the apparent position of the first pin. The real depth and the apparent depth were measured for various volumes of the liquid.
A plot of the volumes was obtained is shown below.



From the graph determine the refractive index of the liquid (3mks)

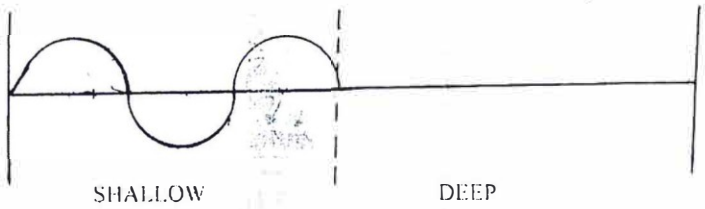
(c) The figure below shows a ray of light incident on a triangular prism and white screen s placed after the prism.



(i) Complete the path of the ray through the prism to show how a spectrum is formed on the screen (2mks)

(ii) A thermometer with a blackened bulb is placed at various parts of the spectrum. State with a reason the region where the thermometer indicates the highest reaching. (2mks)

(d) The figure below shows the displacement of a particle in a progressive wave incident on a boundary between deep and shallow region

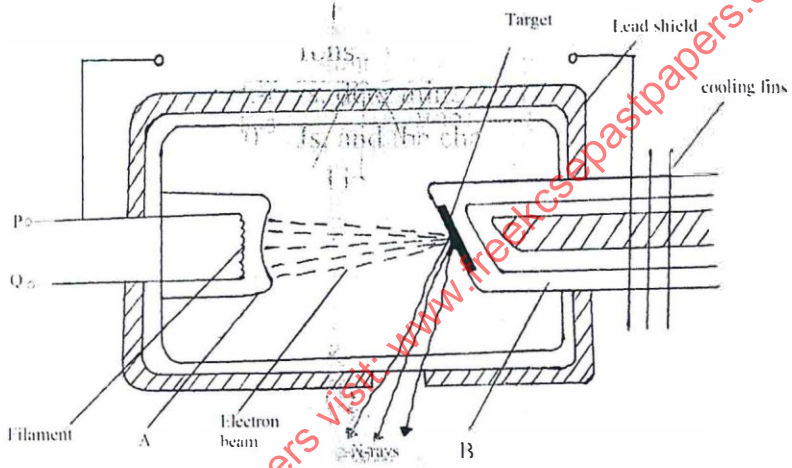


(i) Complete the diagram to show what is observed after boundary (1mk)

(ii) Explain the observation in (i) above (1mk)

(iii) State one assumption made in this experiment (1mk)

15. (a) The figure below shows the features of an x-ray tube



(i) Name the part labelled A and B (2mks)

(ii) Explain how change in the potential across PQ change the intensity of the x-rays produced in the tube (2mks)

(iii) During the operation of the tube, the target becomes very hot. Explain how the heat is caused (2mks)

(iv) What property of lead makes it suitable for use as shielding material? (1mk)

(b) In a certain X-ray tube, the electrons are accelerated by a pd of 12000v. Assuming that all the energy goes to produce x-rays, determine the frequency of the X-rays produced. (Take Planck's constant $h=6.62\times10^{-34}$ Js, and the charge an electron $e=1.6\times10^{-19}$c) (3mks)

16. (a) Define the following terms as used in photo electric effect

(i) Threshold frequency (f_o) (1mk)

(ii) Work function W_o (1mk)

(b) A surface whose work function $W_o=6.4\times10^{-19}$j in illuminated with light of frequency $f=3.0\times10^{15}$Hz. Find the maximum Kinetic energy of the emitted photoelectrons (Take planks constant $h=6.62\times10^{-34}$Js)

Mock Examinations

232/3

PHYSICS

PAPER 3

TIME: 2 ½ HOURS

Question 1

You are provided with the following apparatus

- Meter rule
- One 50g mass
- Vernier callipers
- Stopwatch
- Raised surface
- G-clamp
- Cellotape
- Three 100g masses

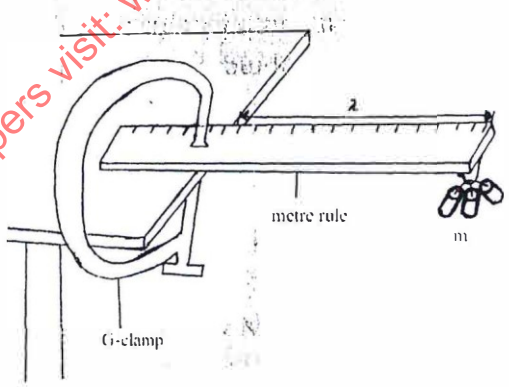
Proceed as follow

(i) Using the vernier callipers, measure and record the width b and thickness h of the meter rule

b=.....m (1mk)

h=.....m (1mk)

(ii) Arrange the apparatus as shown in the fig below



(iii) Set the metre rule such that the length l=95cm.

(iv) Take the 100g mass and using the cellotape, fix firmly so that its geometric at centre is directly below the free edge of the metre rule.

(v) Pull the end of the metre rule with the mass m to give it vertical displacement, then release as you start the stop watch to determine the time t for 10 oscillations. Record the time t in the table of results.

(vi) Repeat step (iv)-(v) for the other masses and complete the table of results (6mks)

Mass m(kg)	Time t for 10 oscillation(s)	Periodic table t(s)	$T^2(S^2)$
0.1			
0.15			
0.20			
0.25			
0.30			

(vii) Plot a graph of T^2 against m on the grid provided.

(viii) Determine the slope s of the graph (3mks)

(ix) The equation of the graph is given by

$$T^2 = \frac{16\pi^2 ml^3}{bh^3 k}$$

Determine the value of K ,the elastic constant of the metre rule. (4mks)

QUESTION 2

You have been provided with the following apparatus

2 dry cells

A cell holder

A bulb

A cardboard with a slit

A meter rule

A white screen

A beaker containing water about ¾ full

A cotton thread about 50cm long.

(a)

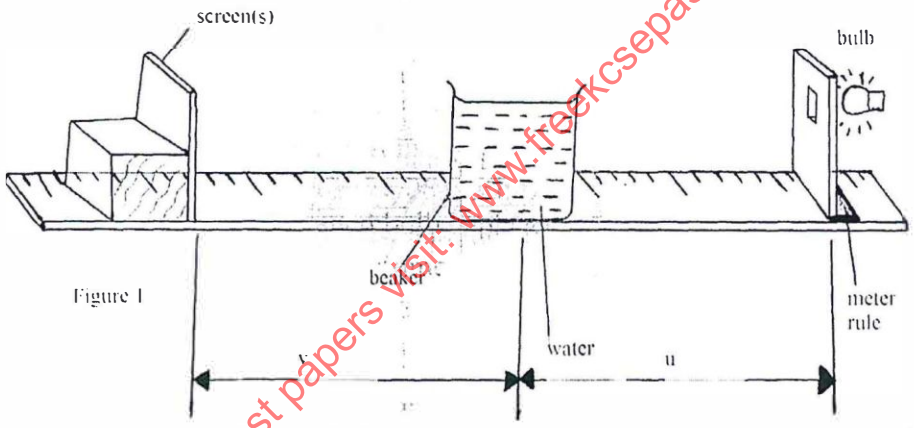


Figure 1

(i) With the cotton thread provided , measure C the external circumference of the beaker

C= _____cm (1mk)

(ii) Find Δ the diameter of the beaker given that $\Delta = \frac{C}{\pi}$ _____cm (1mk)

(iii) Place the beaker such that its centre is at the 50cm mark-as shown in the figure 1 above.

(iv) Set the illuminated slit at a distance u=15cm from the beaker.

(v) Move the screens to and fro to obtain a sharp image on it.

(vi) Measure and record the distance V from the screen to the centre of the beaker.

(vii) Repeat steps (iv to vi) above for values of u as 20 ,25,30,35 and 40 cm respectively.

(viii) Complete the table below (7mks)

Object distance u(cm)	15	20	25	30	35	40
Image distance x(cm)						
$\frac{1}{u} cm^{-1}$						
$\frac{1}{v} cm^{-1}$						

(ix) Plot the graph of $\frac{1}{u}cm^{-1}$ against $\frac{1}{v}cm^{-1}$ (5mks)

(x) State the intercepts (i)Iy y-intercept_____ (1mk)

(2)Ix x-intercept_____ (1mk)

(xi) Calculate A if $A = \frac{Iy + Ix}{2}$ _____ (1mk)

(xii) Given that $k = \frac{4}{4 - AD}$ to the nearest 3 d.p (3mks)

Mock Examinations

HISTORY AND GOVERNMENT

PAPER 1

TIME: 2½ HRS

SECTION A (25 MARKS)

(Answer all questions)

1. Name two electronic sources of information on history and government. (2 mks)

2. Identify one community in Kenya that belongs to the River Lake Nilotes. (1 mk)

3. Mention two economic benefits of the Omani rule along the Kenyan Coast during the 19thC. (2mks)

4. Identify one town that developed as a result of the long distance trade on the East African coast.(1 mk)

5. Name two ways in which Kenyan citizenship can be acquired. (2 mks)

6. State two ways in which the Kenya constitution promotes national unity. (2 mks)

7. Identify one type of democracy. (1 mk)

8. State two main changes in the Kenyan New constitution that were promulgated on 28 August 2010. (2 mks)

9. Give two special rights enjoyed by people with disability in Kenya. (2 mks)

10. Name one Kenyan community that showed mixed reaction to the British. (1 mk)

11. State two objectives of education offered by the missionaries in Kenya during the colonial period. (2 mks)

12. Identify one negative consequence of urbanization in Kenya during the colonial period. (1 mk)

13. State one achievement of Wangari Maathai. (1 mk)

14. Give the main function of the correctional service Department in Kenya. (1 mk)

15. State two pillars of Nyayoism. (2 mks)

16. State one reason why National constituency development fund was introduced by the government. (1 mk)

17. Identify one role played by theatres in Kenya. (1 mk)

SECTION B - 45 MARKS
(Answer Any 3 questions)

18a) State five reasons why the Cushites migrated from their original homeland in Pre-colonial period. (5 mks)

b) Explain 5 results of the Cushites migration and settlement into Kenya. (10 mks)

19a) Give five factors that facilitated the development of the Indian Ocean trade. (5 mks)

b) Describe five positive effects of missionary activities in East Africa. (10 mks)

20a) State three reasons why the Wanga collaborated with the British. (3 mks)

b) Discuss the effects of the Maasai collaboration with the British in Kenya. (12 mks)

21a) Give three reforms recommended by the lyttelton constitution of 1954. (3 mks)

b) Explain six reasons why Africans started Independent Churches and schools in Kenya. (12 mks)

SECTION C - 30 MARKS
Answer any two questions

22a) State three circumstances that can make a Kenyan citizen to be denied the right to life. (3 mks)

b) Explain six civil responsibilities of a Kenyan citizen. (12 mks)

23a) Give three reasons why general elections are important in Kenya. (3 mks)

b) Discuss six functions of the Independent Electoral and Boundaries Commission in Kenya. (12 mks)

24a) Why does the government of Kenya prepare an annual budget. (5 mks)

b) What measures does the Kenyan government take to ensure that public funds are properly used. (10 mks)

Mock Examinations
311/2
HISTORY AND GOVERNMENT
PAPER 2
TIME: 2½ HRS

SECTION A (25 MARKS)
(Answer all questions)

1. Identify two limitations of using written records as a source of information on History and Government. (2mks)

2. State the scientific theory that explains the origin of human beings. (1mk)

3. Name one method of irrigation used in the development of early agriculture in Egypt. (1mk)

4. State two problems faced by traders when using the barter system. (2mks)

5. Give two methods used to acquire slaves from West Africa during the Trans-Atlantic trade. (2mks)

6. State two disadvantages of using fire and smoke signals as a means of communication. (2mks)

7. Identify one scientific discovery during the 19th century which contributed to food preservation. (1mk)

8. Name one metal that was used as currency in Pre-colonial Africa. (1mk)
9. Identify two factors that led to the growth of Athens as an urban centre. (2mks)
10. State the main function of the Golden stool in the Asante Empire during the Pre-colonial period. (1mk)
11. Name one treaty signed between Lobengula and the British during the process of colonization of Africa. (1mk)
12. Identify two chartered companies which were used to administer European colonial possessions in Africa. (2mks)
13. Name one political party that fought for independence in Ghana. (1mk)
14. Identify two types of weapons used during the cold war. (2mks)
15. State two ways in which Non-Aligned Movement safeguard their national security. (2mks)
16. Name one financial institution established by African Union (AU) 1mk)
17. Name one major political party in Britain. (1mk)

SECTION B (45 MARKS)

Answer any three questions in this section.

18a) State five ways in which the development of the upright posture improved the early man's way of life. (5mks)
b) Describe the life of early man during the Old Stone Age period. (10mks)
19a) Mention three advantages of using animal transport as compared to human transport. (3mks)
b) Explain six factors which promoted plantation farming in Europe during the Agrarian Revolution. (12mks)

20a) Why did Mzilikazi welcome the missionaries in Matebele land? (3mks)
b) Why was Samori Toure finally defeated by the French in 1898? (12mks)

21a) State three similarities between the French and the British structure of administration in Africa. (3mks)
b) Explain six ways in which the application of direct rule in Zimbabwe affected the African. (12mks)

SECTION C (30 MARKS)

Answer any two questions in this section

22a) State three economic activities that were carried out by the Shona in pre-colonial period. (3mks)
b) Describe the social organisation of the Shona people during the pre-colonial period. (12mks)

23a) Identify the achievements of the League of Nations. (5mks)
b) Explain the factors that have undermined the activities of the United Nation (UN) (10mks)

24a) Identify three circumstances that may make a Vice President assume presidency in India. (3mks)
b) Explain the functions of the President of India. (12mks)

Mock Examinations
313/1
CHRISTIAN RELIGIOUS EDUCATION
Paper 1
2 ½ Hours

1. a) Describe the first creation account Genesis 1:2-4a. (8marks)
   b) Identify ***seven*** attributes of God from the Biblical accounts of creation. (7marks)

   c) State ***five***ways in which Christians continue with God's work of creation today. (5 marks)

2. a) Outline s***even*** activities carried out by the Israelites on the Passover. (7marks)
   b) How the Israelites worshipped God when they were in the wilderness. (7marks)
   c) State the ways in which Christians can promote True worship of God. (6 marks)

3. a) Describe the characteristics of the local Canaanite religion. (8marks)
   b) From the story of Naboth's vineyard, explain three commandments which King Ahab and Queen Jezebel broke. (6 marks)
   c) What life skills do Christians need to use in order to fight corruption in Kenya today? (5 marks)

4. a) Explain ***Seven*** roles of prophets in the Old Testament. (7marks)
   b) State ***eight*** teachings of prophet Amos about the day of the Lord. (8marks)
   c) What is the relevance of the remnant and restoration to Christians today? (5marks)

5 a) Describe the dedication of the wall of Jerusalem (Nehemiah 2: 27-47). (8marks)
   b) Outline **six** messages of prophet Jeremiah in his letter to the exiles. (6marks)
   c) In what ways do Christians use the print media to spread the gospel? (6marks)

6 a) Give ***six*** reasons why the initiates are secluded for a period of time in traditional African communities. (6marks)
   b) Describe the ways in which initiation rites have changed today. (7marks)
   c) How are the youth preparedfor adult life in the church in Kenya today (7marks)

Mock Examinations
313/2
CHRISTIAN RELIGIOUS EDUCATION
Paper 2
2 ½ Hours

1. Describe Prophet Nathan's prophecies concerning the messiah. (7marks)
   b) Outline the message the of Zechariah in his hymn '' the Benedictus'' after naming John the Baptist(Luke 1: 67-79). (8 marks)
   c) Explain the importance of singing in a Christian service. (5 marks)

2. a) Describe the healing of the Gerasene Demonic (Luke 8: 26-39). (6 marks)
   b) Outline ***eight***qualities of a true disciple according to the teachings of Jesus. (8marks)
   c) State ***six***lessons Christians learn from the healing of the Centurion servant.(6 marks)

3 **a)** Describe the cleansing of the temple by Jesus in Jerusalem (Luke 19:41-48). (7 marks)
   b)Outline the **p**reparation that Jesus made for the last supper (Luke 22: 7-14). (8 marks)
   c) What lessons Christians learn from Judas Iscariot's betrayal of Jesus. (5marks)

4 **a)** Explain***Four***teaching of Jesus about the vine and branches as a symbol of unity of believers (John 15: 1-10). (8 marks)
   b) Outline the teachings of St. Paul on the unity of believers as expressed in the concept of the bride (2 cor. 11:2,Rev 21:1-12). (6 marks)
   c) Give ***six***criteria for discerning the gifts of the Holy Spirit. (6 marks)

5 **a)**.State ***six*** ways in which Christians demonstrate responsible parenthood. (6marks)
   b).Outline **Seven**Christianteachings about work. (7marks)
   c) Identify the criteria which Christians use to choose appropriate leisure activities.(7 marks)

6 a) State ***six*** ways in which the church and the state work in harmony in Kenya today. (6marks)
   b) Outline s***even*** problems related to the maintenance of law and order in Kenya today. 7marks)
   c) State the remedies that can be put in place to minimize ethnicity in Kenya today. (7marks)

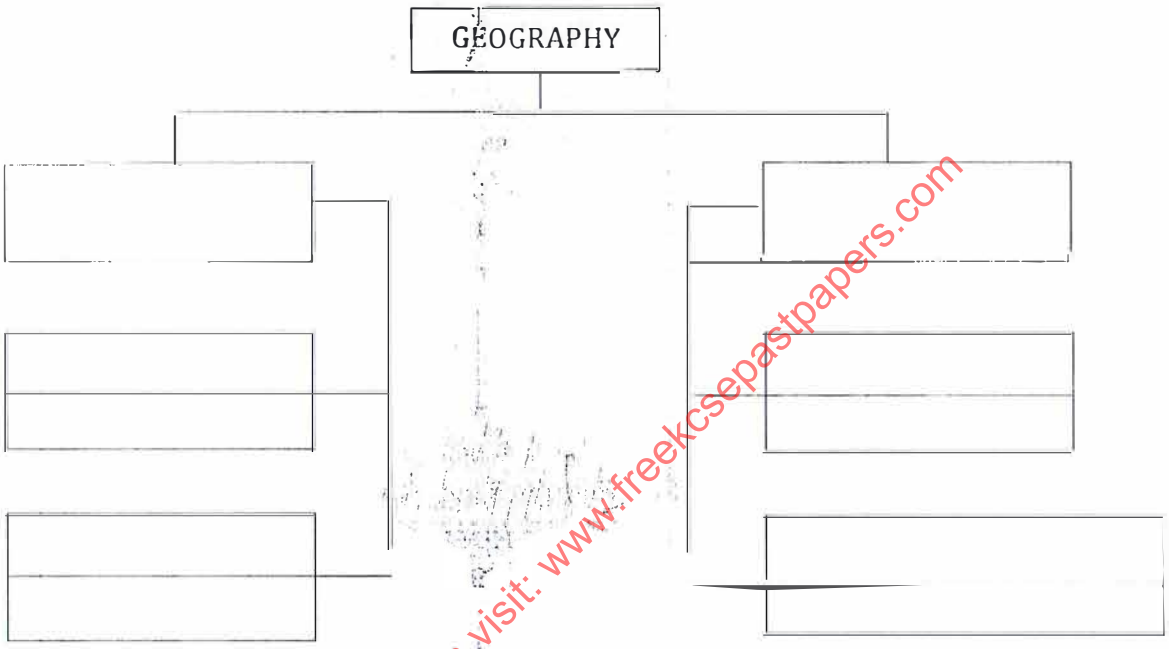
Mock Examinations
312/1
GEOGRAPHY
Paper 1
Time: 2¾ hours

SECTION A

*Answer **all** the questions in this section.*

1. (a) Show how Geography is related to Chemistry. (2 marks)

(b) The diagram below shows the interrelationship between Geography and other disciplines.



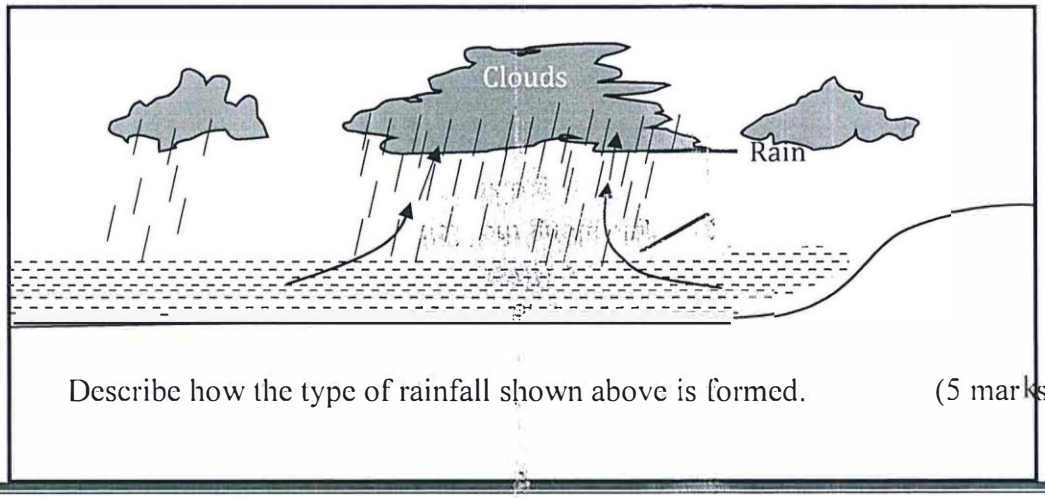
(i) Identify the disciplines marked **X** and **Y**. (2 marks)

(ii) Name the subject marked **Z**. (1 mark)

2. (a) Give the forces responsible for the earth's shape. (2 marks)

(b) State ***three*** effects of revolution of the earth. (3 marks)

3. Use the diagram below to answer the question below:



Describe how the type of rainfall shown above is formed. (5 marks)

4. (a) Apart from gravitative pressure, give ***two*** other natural causes of earthquakes. (2 marks)

(b) State ***three*** effects of earthquakes on human environment. (3 marks)

5. Describe processes leading to the formation of drumlins. (5 marks)

SECTION B

*Answer question **6** and any other **TWO** questions from this section.*

6. Study the map of OYUGIS 1 : 50, 000 provided and answer the following questions.

a. i. Calculate the longitudinal extent of the area covered by the map. (2 marks)

ii. State three types of vegetation found in the area covered by the map. (3 marks)

b. Citing evidence from the map, state three economic activities taking place in the area covered by the map. (3 marks)

c. i. List down four proofs indicating that the area receives high rainfall. (4 marks)

ii. Measure the length of all weather road bound surface from grid reference 918418 to 930360. State your answer in Kilometers and Meters. (2 marks)

d. i. Describe the drainage of the area covered by the map. (4 marks)

ii. Using a scale of 1 Cm to represent 50 meters draw a cross-section from Easting 77 to Easting 84 along Northing 25 on it mark.

i. A slope (1 mark)

ii. All weather road loose surface (1 mark)

iii. A hill. (1 mark)

iv. Calculate the vertical exaggeration of the cross section. (1mark)

7. (a) What is a rock? (2 marks)

(b) (i) Name ***three*** examples of intrusive igneous rocks. (3 marks)

(ii) Describe ***three*** ways in which sedimentary rocks may be formed. (6 marks)

(c) (i) Describe how a sill is formed. (4 marks)

(ii) State the characteristics of a composite volcano. (4 marks)

(d) Explain ***three*** ways in which volcanic mountains positively influence human activities. (6 marks)

8. (a) What is secondary vegetation. (2 marks)

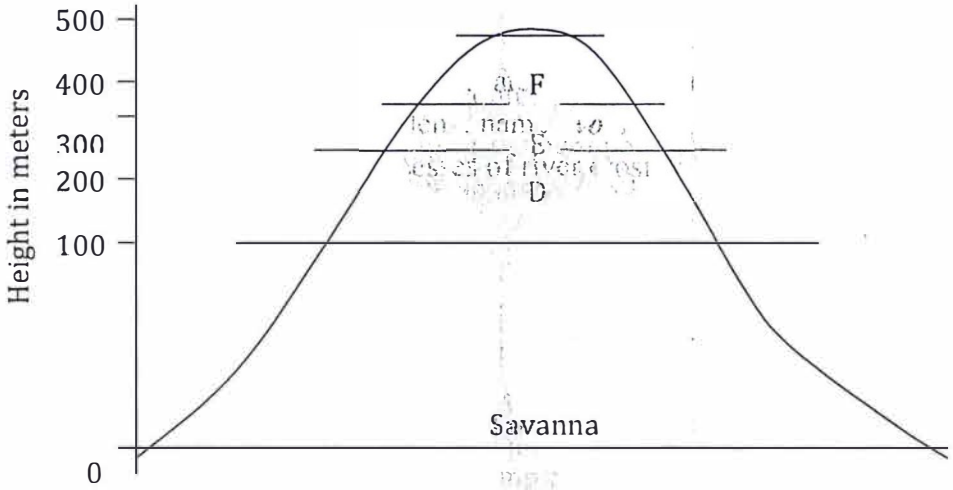
(b) Explain how the following factors influence the distribution of vegetation

(i) Aspect (2 marks)

(ii) Precipitation (3 marks)

(iii) Identify ***three*** vegetation zones of Kenya. (3 marks)

(c) (i) The diagram below represents zones of natural vegetation on a mountain within the tropical region. Use it to answer questions that follow.



Name the vegetation zones marked **D, E** and **F**. (3 marks)

(ii) Describe the characteristics of tropical savanna vegetation. (8 marks)

(d) State ***four*** significances of vegetation to human activities. (4 marks)

9. (a) (i) What is a delta? (2 marks)

(ii) State ***three*** conditions which favour formation of a delta. (3 marks)

(iii) Give ***two*** examples of arcuate deltas in Africa. (2 marks)

(iv) Apart from arcuate delta, name ***two*** other types of deltas. (2 marks)

(b) Describe the following processes of river erosion

- Abrasion (3 marks)
- Hydraulic action (4 marks)

(c) State ***three*** ways in which gorges are formed. (3 marks)

(d) (i) Using a well labelled diagram, describe dendritic drainage pattern. (3 marks)

(ii) State ***three*** negative effects of rivers on human activities. (3 marks)

10. (a) Differentiate between soil texture and soil structure. (2 marks)

(b) (i) Apart from organic matter, name ***four*** other components of soil. (4 marks)

(ii) State ***four*** ways in which humus contributes to the quality of soil. (4 marks)

(iii) Explain how the following farming practices may result to loss of soil fertility.

- Continuous irrigation (2 marks)
- Overgrazing (2 marks)
- Overcultivation (2 marks)

(c) Give ***three*** soil farming processes (3 marks)

(d) State how natural vegetation may prevent soil from erosion. (6 marks)

Mock Examinations
312/1
GEOGRAPHY
Paper 2
Time: 2¾ hours

SECTION A (25 MARKS)

Answer all questions in this section

1. (a) Differentiate between a forest and forestry. (2 marks)
   (b) State **three** benefits of Agro-forestry. (3 marks)

2. (a) What is urbanization. (2marks)
   (b) State **three** factors which have led to the development of Mombasa as a major sea port in the region (3marks)

3. (a) State **two** causes of international migration. (2 marks)
   (b) Give **three** factors responsible for the low fertility rate in Sweden. (3 marks)

4. (a) Give **two** economic benefits of Southern African Development Co-operation (SADC) to member states. (2 marks)
   (b) State **three** measures that Kenya can take in order to reduce her unfavourable balance of trade. (3 marks)

5. a) State **two** ways through which minerals occur on the earth crust (2 marks)

   b) Give **three** effects of mining on the environment (3 marks)

SECTION B

Answer question 6 and any other two questions from this section

6. The table below shows palm oil production in '000' litres between 2005 and 2008. Use it to answer question (a) and (b)

Zones	2005	2006	2007	2008
Sapele	41	51	58	49
Calabar	30	41	52	60
Ibadan	27	36	48	50
Onitisha	26	22	17	11

   (a) (i) Using a vertical scale of 1cm to represent 10,000 litres draw a compound bar graph to represent the above data (7marks)
   (ii) State **three** characteristics of a compound bar graph (3 marks)

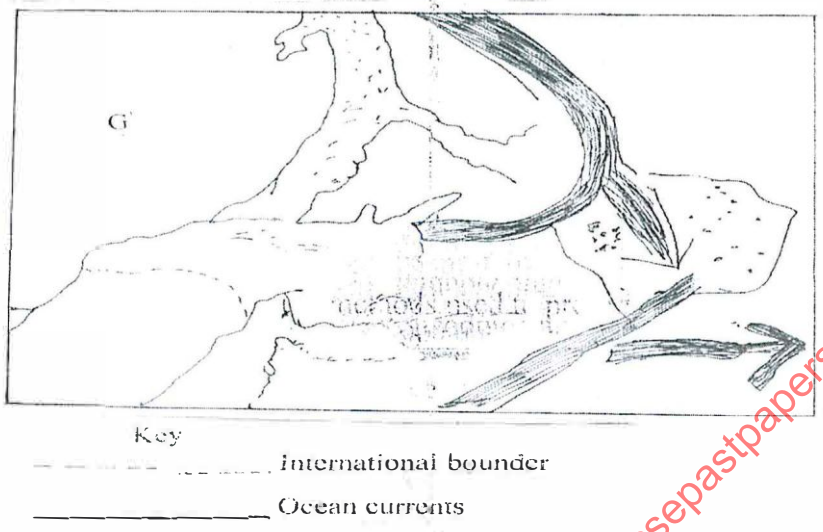
(b) Give **three** physical conditions that favour growing of oil palm in Nigeria (3 marks)

(c) (i) Describe any **three** geographical conditions favouring maize growing (6 marks)

(ii) Apart from Trans-Nzoia District name any other **two** districts where maize is grown in large scale in Kenya (2 marks)

(iii) Identify **four** characteristics of horticulture in Kenya (4 marks)

7. Use the map of North – West Atlantic below to answer questions (a) and (b)



(a) (i) Name the country marked G (1 mark)

(ii) Explain how the **two** ocean currents showing on the map influence fishing in the area (4 marks)

(b) Explain **three** factors that favour fishing in the areas shaded on the map other than the ocean Currents (6 marks)

(c) (i) Explain why in East Africa fresh water is more developed than marine fishing (6 marks)

(ii) Describe how the trawling method is used to catch fish (5 marks)

(iii) List **three** methods used to preserve fish (3 marks)

8. (a) (i) What is domestic tourism? (2 marks)

(ii) State **three** reasons why the Kenyan government encourages domestic tourism. (3 marks)

(b) (i) Give **three** tourist attractions found at the coast of Kenya. (3 marks)

(ii) Explain **four** measures that Kenya should take in order to attract more tourists. (8 marks)

(c) Explain the differences between the tourist attractions in Kenya and Switzerland under the following sub-headings:

- Security (2 marks)
- Culture (2 marks)
- Sceneries. (2 marks)

(d) Give **three** ways through which wildlife is conserved in Kenya. (3 marks)

9. (a) (i) What is industrial inertia? (2 marks)
(ii) State **two** causes of industrial inertia. (2 marks)
(b) Explain how the following factors influence the location of industries.
- Market (4 marks)
- Transport and communication (4 marks)

(c) Explain **four** benefits which Kenya has derived from industrialization. (8 marks)
(d) Give **five** advantages of decentralization of industries in Kenya. (5 marks)

10. a) i) Give **three** common methods through which land has been reclaimed in Kenya. (3 marks)
ii) Give **two** methods that are used to drain swamps in Kenya. (2 marks)
b) i) Name **two** rivers that supply water to the Mwea irrigation scheme (2 marks)
ii) Explain how the following factors influenced the establishment of Mwea irrigation scheme.
- Topography (2 marks)
- Soils (2 marks)
- Population (2 marks)
- Government policy (2 marks)

c) i) Name **three** areas that make up the Zuider zee reclamation project in the Netherlands. (3 marks)
ii) Explain **four** differences between reclamation in Kenya and the Netherlands. (8 marks)

Mock Examinations
565/1
Business Studies
Paper 1
Time: 2 Hours

1. Highlight four negative effects of production activities on the environment and community health. (4 marks)
2. Outline four reasons why there is a lot of government support on the activities of entrepreneurs in Kenyan today. (4 marks)
3. State four reasons why human beings satisfy their basic wants before the secondary wants. (4 marks)
4. State the names of the equipments that fit the description given below: (4 marks)

Description	Equipment
a) Cutting unwanted documents into small pieces to prevent them from landing into unauthorized hands	
b) For preparing cash receipts	
c) For printing postage impressions on envelopes	
d) Used to transmit printed messages such as letters, maps, diagrams, etc	

5. Outline four ways in which a firm can improve the productivity of human resources (4 marks)
6. State four advantages of processing zones (EPZ) to a country. (4 marks)
7. List four essential elements of a transport system. (4 marks)
8. Sukemo Enterprises intends to promote its products to increase sales volume. Highlight any four circumstances under which the business would choose to use personal selling. (4 marks)
9. Using a diagram show the effect on equilibrium price and quantity when supply increases and demand falls. (4 marks)
10. Outline four roles played by the stock exchange market in the economy. (4 marks)
11. Explain the meaning of the following terms as used in insurance. (4 marks)
    i)Cover Note _____
    ii)Surrender value
    iii)Pure risk _____
    iv)Sum insured/assured _____
12. Outline four causes of breakdown in communication. (4 marks)
13. Highlight four factors that may limit the effectiveness of bank rate in controlling credit. (4 marks)
14. For each of the following transactions, state the account t be debited and the account to be credited. (4 marks)

Transaction	Account Debited	Account Credited
i) Owner took cash for personal use		
ii) Bought goods and paid by cheque		
iii) Owner brought in cash from private sources		
iv) Paid Ouma (a creditor) by cheque		

15. Outline four advantages of privatizations. (4 marks)
16. Outline four positive implications of a youthful population to an economy. (4 marks)
17. Outline four ways in which consumers are likely to suffer in a situation where there is no warehousing. (4 marks)
18. Fill the blanks in the table below: (4 marks)

Name of document	**Purpose of documents**	**Issued by**
a) Letter of inquiry	_____	Buyer
b) Local purchase order	_____	Buyer
c) Invoice	To demand for payment	_____
d) _____	To correct an undercharge	Seller

19. Give any four reasons why small scale firms continue to exist in an economy dominated by large scale firms. (4 marks)
20. Outline four characteristics of an Oligopolistic market structure. (4 marks)

21. Menja Traders had the following ledger account balances as at 31st December 2014

	Kshs.
Sales	100,000
Purchases	170,000
Returns Inwards	10,000
Returns Outwards	20,000
Salaries	30,000
Capital	40,000
Bank loan	50,000

Prepare the business trial balance as at 31st December 2014 (4 marks)

22. Outline four ways that the World Bank may use to assist developing countries to improve their economies. (4 marks)

23. The cash book below was incorrectly prepared

Dr. Cash Book Cr.

Date	Particulars	Cash	Bank	Date	Particulars	Cash	Bank
1990				1990			
May	Bal b/d	800	1880	May	Sales	1640	
1	Purchases		1520	2	Electricity		620
"	Wages	500		"	Mbori	250	
3	Muhia(Debtor)		400	5	(creditor)		830
"	Bal c/d	590		"	Rent received		2350
4				9	Bal c/d		
"				"			
7				12			
"				"			
12				12			
		1890	3800			1890	3800
					Bal b/d	590	
				13			

Identify transactions that were wrongly entered in the cash book (4 marks)

24. The average consumer price for a loaf of bread in various year is shown in the figure below:

Year	Consumer Price	Consumer Price Index
2009	30	100
2010	36	
2011	42	
2012	47	
2013	52	

Calculate the consumer price index for 2010-2013 using 2009 as the base year. (4 marks)

25. Mumo Enterprises had a working capital of Ksh 300,000 and a current ratio of 4:3 as at 30th June 2016. Calculate the firm's

i) Current assets (2 marks)

ii) Current liabilities (2 marks)

Mock Examinations
565/2
BUSINESS STUDIES
PAPER 2
TIME: 2½ HOURS

1. a) Explain **five** factors that may have contributed to the slow pace in the achievement of most African trade agreements. (10marks)
   b) Explain **five** personal attributes of an office worker. (10marks)

2. a) The Kenyan Community has great disparity in income distribution. Explain **five** causes of this disparity. (10marks)
   b) Despite their poor performance, the government is still interested in operating public corporations in the country. Explain **five** reasons why this is so. (10marks)

3. a) Make the necessary journal entries using the transactions given below. (10marks)
   2016
   June 3rd: Bought a weighing machine on credit worth Ksh 60,000 from Makenji wholesalers.
   4th: Converted a personal car worth Ksh 500,000 into business asset.
   7th: Sold an old tractor on credit to Onyango worth Ksh 75,000.
   20th: Correction of an error having sold a typewriter on credit to Kagumo but wrongly debited to Kigumo account Ksh 10,000.
   25th: Sold a book shelf valued at Ksh 80,000 for Ksh 76,000 to Heshima on credit.
   28th: Sold a table worth Ksh 3,000 to Tommy on credit for Ksh 3,500.

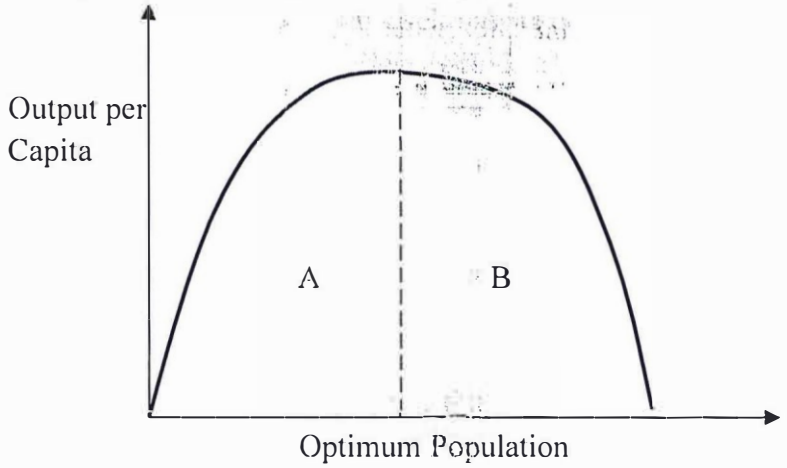
   b) The following table shows the percentage contribution in each of the three levels of production in generating income to a country.

Level of production	Primary	Secondary	Tertiary
% Income Contribution	60	30	10

   Explain **five** factors that may have led to a higher proportion of income contributed by the primary level. (10marks)

4. a) Explain **five** trends in road transport in Kenya. (10marks)
   b) Explain **five** measures that a country may take to ensure proper development planning. (10marks)

5. a) The diagram below represents the population output per capita of a certain country. Explain **five** challenges to the country if her total population is found at the part marked **A**.



b) IVY-JUNE partnership was converted into IVY-JUNE Ltd Company. Explain **five** benefits that may accrue as a result of this conversion. (10marks)

6. a) Explain **five** circumstances that would influence a producer to use wholesalers in distributing farm produce. (10marks)

b) The following trial balance was extracted from the books of Barca investments as at 31 .12 .2014

	DR.	CR.
Sales/purchases	420,000	980,000
Discounts	40,000	36,000
Returns	25,000	32,000
Building	800,000	
Cash	90,000	
Bank	320,000	
Salaries	140,000	
Debtors/Creditors	256,000	168,000
Loan		340,000
Insurance	86,000	
Rent		40,000

Additional Information

(i) Stock at end of period was shs. 54.000
(ii) Salaries accrued end of year was shs. 20,000
(iii)Prepaid insurance by Dec. 31.2006 was shs. 10,000

Required

(i) Trading, Profit and Loss account
(ii) Balance sheet

Mock Examinations
443/1
AGRICULTURE
Time: 2Hours

SECTION A (30MKS)

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

1. List four farming practices that help to reduce the effect of water shortage in crops (2mks)
2. State four main characteristics of shifting cultivation. (2mks)
3. State the importance of sub soiling (1mk)
4. List three advantages of tissue culture (1 ½ mks)
5. State two benefits of optimum soil temperature in crop production. (1mk)
6. Give four soil factors that influence soil productivity. (2mks)
7. Give three characteristics of fixed inputs (1 ½ mks)
8. State four factors which determine the depth of ploughing. (2mks)
9. Give two main methods of conveying water from place to place. (2mks)
10. Differentiate between seed dormancy and seed viability (2mks)
11. State any four factors that determine the spacing of a crop (2mks)
12. Explain the meaning of the following terms as used in pasture establishment

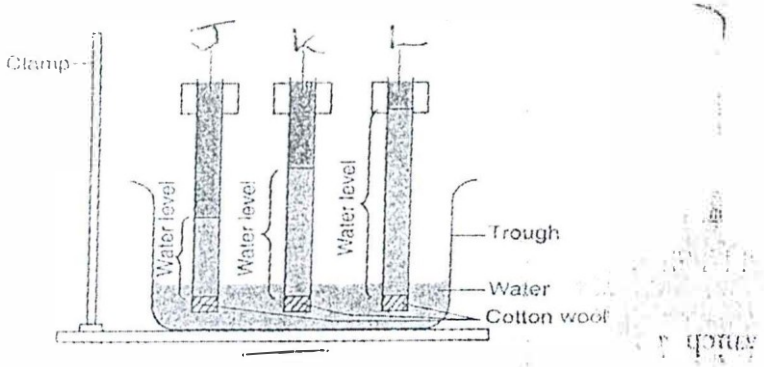
(i) Topping (1 mk)
(ii) Ley pasture.(1mk)
(iii) Rest period (1mk)

13. a) Give three causes of blossom end rot in tomatoes (1 ½ mks)
    b) State one method of controlling blossom end rot in tomatoes (½mk)
14. Define the terms
    a) Afforestation (1mk)
    b) Re-afforestation(1mk)
15. State four factors that contribute to the competitive ability of weeds.(2mks)
16. State four types of micro catchments (2mks)

SECTION B (20MKS)

Answer ALL questions in this section in the spaces provided

17. The diagram below shows an illustration on a property of soil using soil sample labeled J, K and L

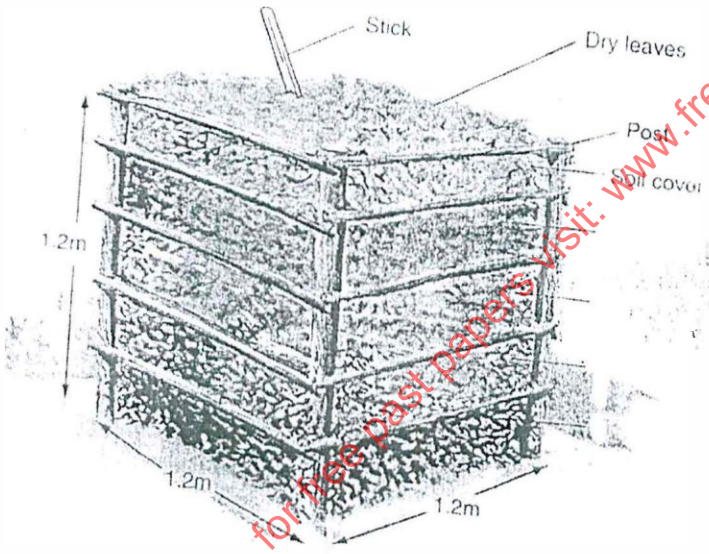


(a) The levels of water were observed after 2 hours, name the property of soil being investigated. (1 mark)

(b) List two properties of soil J. (2 marks)

(c) Which soil would be suitable for growing paddy rice? Give a reason for your answer. (2 marks)

18. Study the diagram below of a method of compost making and answer the questions that follow,



(a) Identify the methods of compost making (1 mark)

(b) State four factors to consider when sitting the structure (2marks)

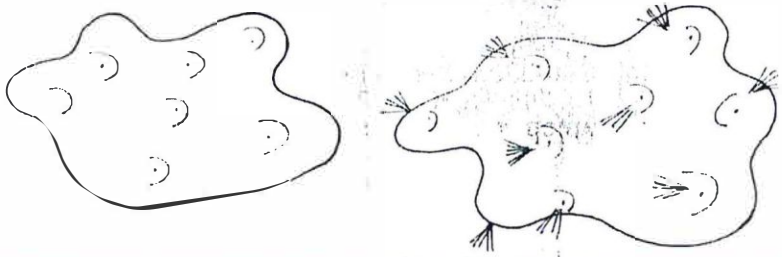
(c) What is the function of the following materials in preparation of compost manure:

(i) Top soil (1 mark)

(ii) Wood ash (1 mark)

19. Below are two diagrams of Irish potato tubers after being subjected to some m conditions before planting.

D1 D2



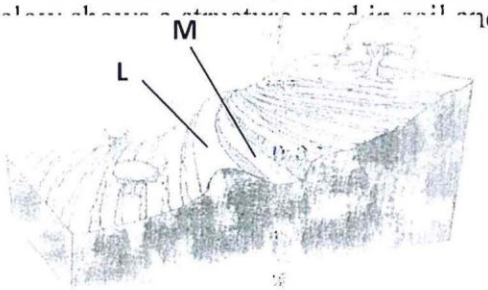
Before subjecting to the conditions After subjecting to the conditions

(i) Which process of potato treatment is illustrated above? (1mk)

(ii) State **two** conditions necessary for the above process. (2mks)

(iii) Give **two** reasons for carrying out the above practice. (2mks)

20. The illustration below shows a structure used in soil and water conservation



(a) Identify the structure (1mk)

(b) Identify parts labelled **L** and **M** in the structure. (2mks)

(c) How can part labelled **L** be stabilized after it has been constructed . (1mk)

(d) State any **one** factor that would determine the width and depth of the structure. (1mk)

SECTION C (40MKS)

Answer any TWO questions in this section in the spaces provided after question 22

21. a). Describe the field production of dry beans under the following sub headings

i). Planting (5mks)

ii) Weed control (2mks)

iii) Harvesting (5mks)

(b) Describe four effects of land fragmentation and sub-division. (8mks)

22. (a) Explain **five** advantages of budgeting in farming (10mks)

(b) Explain **five** various types of risks and uncertainties (5mks)

(c) Describe the importance of pruning perennial crops (5mks)

23. a). Describe the effects of liberalization of agricultural markets to farming in Kenya (10mks)

b). Explain how price is determined in a free market situation (3mks)

c). with examples explain how government policies affect agricultural production (7mks)

Mock Examinations
443/2
AGRICULTURE
TIME: 2 HOURS

SECTION A (30 MARKS)

Answer all questions in this section in the spaces provided after each question.

1. Name an exotic beef breed of cattle with the following characteristics
   -Black in colour
   - polled
   -Has a long cylindrical compact and deep body. (1mk)
2. Give five reasons for identification of cattle in cattle management. (2 ½ mks)
3. State four qualities of eggs preferred by consumers in the market (2 mks)
4. (a) List four predisposing factors of livestock diseases. (2 mks)

   (b) Distinguish between isolation and quarantine in livestock health. (2 mks)

   (**c**) Name the intermediate and final host of the tapeworm.
   Intermediate..... **(½mk)**
   Final..... **(½mk)**

5. State one role of the damp proof course in the foundation of a farm building. (½mk)
6. List three signs of farrowing in a sow. (1 ½ mks)
7. State **two** reasons for raddling in sheep management. (2marks)
8. Name the livestock diseases that may be controlled by use of artificial insemination.(1 mk)
9. Name four uses of dromedary camel. (2 mks)
10. A part from transmission of disease, give **three** harmful effects of ticks on cattle. (1½ mks)
11. State any **four** factors considered when siting farm structures (2mks)
12. State **four** major categories of farm tools and equipment (2mks)
13. State **two** reasons for proper care and maintenance of farm tools and equipment (1mks)
14. Outline any **four** causes of cannibalism in poultry production. (2mks)
15. Give the functional difference between a rip saw and a tenon saw. (1mk)
16. Name **two** cattle diseases controlled by vaccines. (1mk)
17. Differentiate between a broiler and a capon (1mk)
18. State **two** advantages of using embryo transplant. (1mks)

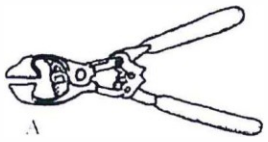
SECTION B (20 MARKS)

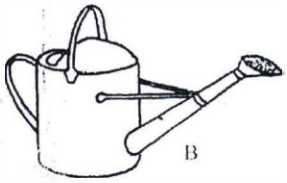
Answer all questions from this section in the spaces provided after each question.

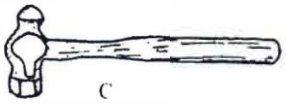
19 (a) If the maize meal contains 6% Digestible Crude Protein (DCP) and Fish meal contains 64% DCP, calculate the amount of each feed stuff in kilogrammes, required to prepare 200kg of chickmash containing 18% DCP (Show your working) (4mks)

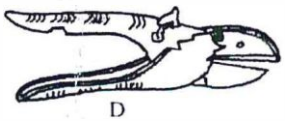
(b) Name **two** other feed ingredients which should be added to the chick mash to make it a balanced feed. (1mk)

20. Below are illustrations of farm tools and equipments.


A


B


C


D

(a) Identify the tool/equipment labelled A and B.

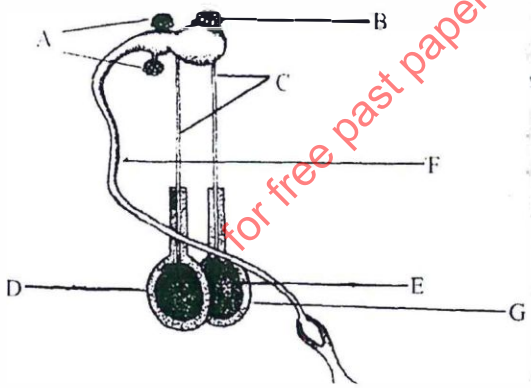
A..... (1 mk)

B..... (1 mk)

(b) State two appropriate uses of the tool labelled C. (1 mk)

(c) Explain two maintenance practices of the tool labelled D. (2 mks)

21. The diagram below shows the reproductive system of a bull. Study the diagram carefully and then answer the questions that follow.

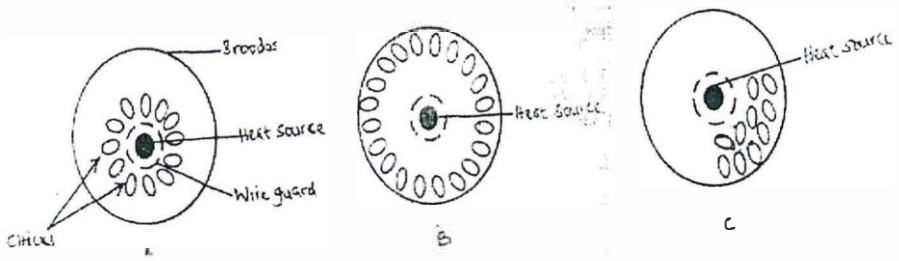


(a) Name the parts labelled A,B and C. (1 ½ mks)

(b) State one function of each of the parts labeled B, D and F. (1 ½ mks)

(c) Explain two suitable conditions for the proper function of part E. (2 mks)

22. Below are illustrations showing the behavior of chicks in various brooders. Study the diagrams and answer the questions that follow.



(i) State the environmental problem in each brooder as illustrated by the behavior of the chicks (3marks)

A.....

B.....

C.....

(ii) State **two** ways of overcoming the problem in **B** (2marks)

SECTION C (40 MARKS)

*Answer any **two** questions from this section in the spaces provided after question 25*

23.(a) Describe conditions under which bees abscond the hive (5mks)

(b) Describe the causes of stress in poultry management (10mks)

(c) Describe the uses of fences on the farm (5mks)

24 (a) State **five** advantages of farm mechanization (5mks)

(b) Give **five** maintenance practices of a water cooling system of a tractor. (5mks)

(c) Describe **Rinderpest** disease under the following sub-headings.

(i) Animals attacked **(2mks)**

(ii) Causal agent. **(1mk)**

(iii) Symptoms of the disease. **(4mks)**

(iv) Control measures. **(3mks)**

25. (a) Explain **four** factors that affect digestibility of food in livestock. **(8mks)**

b) Explain the essentials of clean milk production **(7mks)**

(c) State **five** disadvantages of natural method of mating. **(5mks)**

food

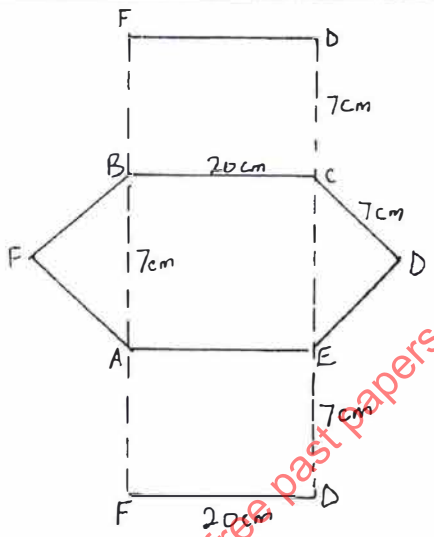
MARKING SCHEME

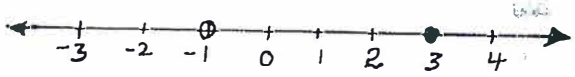
MATHEMATICS

Paper 1

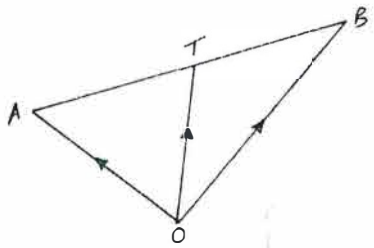
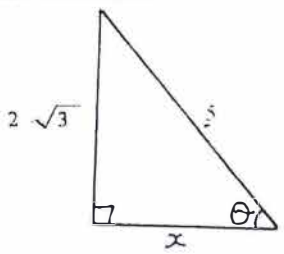
MARKING SCHEME.

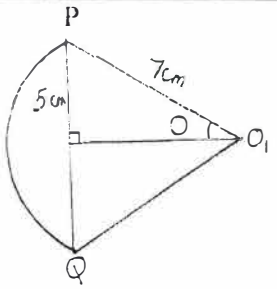
No.	Working	Marks	Remarks
1.	$\frac{5}{6}-\left(\frac{1}{3}\times\frac{27}{20}\right)\div 2$		
	$\frac{5}{6}-\left(\frac{9}{20}\times\frac{1}{2}\right)$	**M1**	For $\frac{9}{20}$
	$\frac{5}{6}-\frac{9}{40}$	**M1**	For $\frac{9}{40}$
	$\frac{100-27}{120}$	**M1**	
	$\frac{73}{120}$	**A1**	
		04	
2.	Grad. Of $AB=\frac{2-4}{-3-6}=\frac{-2}{-9}=\frac{2}{9}$		
	Mid point of $AB=\left(\frac{-3+6}{2},\frac{2+4}{2}\right)$		
	$=(1.5,3)$	**M1**	For $\frac{2}{9}$ *and* $(1.5,3)$
	$\left(\frac{y-3}{x-1.5}\right)\frac{2}{9}=-1$	**M1**	
	$\frac{2y-6}{9x-13.5}=-1$		
	$2y-6=-1(9x-13.5)$		
	$2y-6=-9x+13.5$		
	$2y=-9x+19.5$		
	$y=-\frac{9}{2}x+\frac{19.5}{2}$		
	or $y=-4\frac{1}{2}x+9\frac{3}{4}$	**A1**	
		03	
3.	$15=3\times 5$		
	$25=5\times 5=5^2$		
	$50=2\times 5\times 5=2\times 5^2$	**M1**	
	$L.C.M=2\times 3\times 5^2$		
	$=150$	**M1**	
	$\frac{150 \text{ minutes}}{60 \text{ minutes}}=2\text{Hrs } 30 \text{ min}$	**M1**	
	$\therefore$ they will ring together next at 11.15a.m	**A1**	
		04	

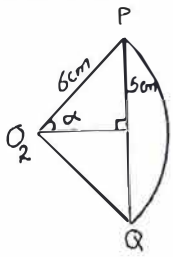
4.	$\frac{x+4}{x-4}-\frac{3(x+4)}{(x-4)(x+4)}$ $\frac{x+4}{x-4}-\frac{3}{x-4}$ $\frac{x+4-3}{x-4}$ $\frac{x+1}{x-4}$	**M1** **M1** **A1**	
		03	
5. (i)	$\angle ABC=180^0-(10+70)^0$ $=180-80^0$ $=100^0$	**M1** **A1**	
(ii)	$\angle OAD=\frac{180^0-(2x70^0)}{2}$ $=\frac{40^0}{2}$ $=20^0$	**M1** **A1**	
		04	
6. (b)	 (i) Area Δ end =	**B1**	
	$\frac{1}{2}\times 7\times 7\sin 60^0$ $=21.21762239$ $\cong 21.22cm^2$ $2d.p$	**B1**	
	(ii) Total surface area= $3\times 20\times 7+2\times\frac{1}{2}\times 7\times 7\sin 60^0$ $=420+49\sin 60^0$ $=462.432448$ $\cong 462.44cm^2$ $2d.p$	**B1**	
	(iii) Volume		

	$= 20 \times \frac{1}{2} \times 7 \times 7 \sin 60^0$ $490 \sin 60^0$ $= 424.3524479$ $\cong 424.35 cm^2 \quad 2d.p$	**B1**	
		04	
7.	$-2x < 2$ $x > -1 \; or \; -1 < x$ $-3x \geq -9$ $x \leq 3 \qquad i.e \qquad -1 \leq x \leq 3$  	**B1** **B1** **B1**	
		03	
8.	$7^{-2n} \times 7^{-3} = 7^1$ $7^{-2n-3} = 7^1$ $-2n-3 = 1$ $-2n = 4$ $n = -2$	**M1** **A1**	
		02	
9.	$2x + 3y = 4^2$ $4x - y = 2^2$ $\Leftrightarrow 2x + 3y = 16 \ldots\ldots\ldots (i) \quad \times 1$ $4x - y = 4 \ldots\ldots\ldots\ldots (ii) \quad \times 3$ $2x + 3y = 16$ $12x - 3y = 12$ $14x + 0 = 28$ $14x = 28$ $x = 2$ $2(2) + 3y = 16$ $3y = 12$ $y = 4$	**M1** **M1** **A1**	For dropping logs Eliminating one variable or equivalent For both x and y
		03	
10	No. who voted $= \frac{55}{100} \times 85000 = 46{,}750$ Votes received by C $= \frac{20}{100} \times 46{,}750$ $= 9350$	**B1** **M1** **A1**	
		03	

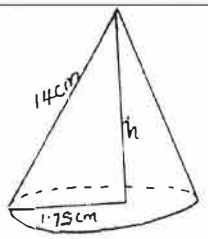
11	$(2n-4)90 = 150n$ $180n - 360 = 150n$ $30n = 360$ $n = 12$	**M1** **A1**	
		02	
12	$1 - \frac{1}{2}\left(\frac{7}{16}\right)$ $= 1 - \frac{7}{32}$ $= \frac{32-7}{32}$ $= \frac{25}{32}$ $\sqrt{1-x} = \sqrt{1-\frac{7}{16}}$ $= \sqrt{\frac{9}{16}} \quad = \frac{3}{4}$ $error = \frac{25}{32} - \frac{3}{4}$ $= \frac{25-24}{32}$ $= \frac{1}{32}$ $\%error = \frac{\frac{1}{32}}{\frac{3}{4}} \times 100$ $= \frac{1}{32} \times \frac{4}{3} \times 100$ $= \frac{100}{24}$ $= 4\frac{1}{6}\%$ or 4.167%	 **M1** **M1** **A1**	
		03	
13	(a) ΔABC and ΔDEC are similar $\frac{DE}{AB} = \frac{EC}{BC}$ $\frac{6}{8} = \frac{EC}{12}$ $EC = \frac{6}{8} \times 12$ $= 9cm$ (b) linear scale factor = 6:8 = 3:4 Area scale factor = 9:16 Area of ΔABC	 **M1** **A1**	

	$= \frac{16}{9} \times area\ of\ \Delta DCE$ $= \frac{16}{9} \times 27$ $= 48cm^2$ $\therefore area\ of\ ABECD = 48 - 27$ $= 21cm^2$	**M1** **A1**	
		04	
14.	 $OB = OA + 2AT$ $= OA + 2(-OA + OT)$ $= OA - 2OA + 2OT$ $= -OA + 2OT$ $= -(i - j + k) + 2(2i + 1\frac{1}{2}k)$ $= -i + j - k + 4i + 3k$ $\therefore OB = 3i + j + 2k$	**M1** **A1**	
		02	
15	$\begin{matrix} & P & Q & R \end{matrix}$ $\begin{pmatrix} -1 & 2 \\ 3 & 1 \end{pmatrix}\begin{pmatrix} 2 & 3 & 6 \\ -1 & 4 & 4 \end{pmatrix}$ $\begin{matrix} & P^1 & Q^1 & R^1 \end{matrix}$ $= \begin{pmatrix} -4 & 5 & -2 \\ 5 & 13 & 20 \end{pmatrix}$ $P^1(-4,20), Q^1(5,13)\ R^1(-2,20)$	 **M1** **A1** **B1**	
		03	
16			

	$\sin\theta = \frac{2\sqrt{3}}{5}$ $x = \sqrt{25-12}$ $\sqrt{13}$ $\cos\theta = \frac{\sqrt{13}}{5}$ $\sin(90-\theta) = \cos\theta = \frac{\sqrt{13}}{5}$ $\cos(90-\theta) = \sin\theta = \frac{2\sqrt{3}}{5}$ $\therefore \tan(90-\theta) = \frac{\sin(90-\theta)}{\cos(90-\theta)}$ $= \frac{\frac{\sqrt{13}}{5}}{\frac{2\sqrt{3}}{5}}$ $= \frac{\sqrt{13}}{2\sqrt{3}}$	**B1** **M1** **A1**	
		03	
17.	 $\sin Q = \frac{5}{7} = 0.7143$ $Q = 45.59^0$ $\angle PO_1Q = 91.17^0$ *Area of sector* PO_1Q $= \frac{91.17^0}{360^0} \times \pi \times 7^2\, cm^2$ $= 38.98 cm^2$ *Arrea of triangle* PO_1Q $= \frac{1}{2} \times 7^2 \times \sin 91.17$ $= 24.49$	**B1** **M1** **A1** **M1**	

		B1	
	$\sin\alpha = \frac{5}{6} = 0.8333$	M1 A1	
	$\alpha = 56.439^0$		
	$\angle PO_2Q = 112.9^0$	M1	
	Arrea of sec*tor* PO_2Q		
	$= \frac{112.9}{360} \times \pi \times 6^2$	M1	
	$= 35.47cm^2$	A1	
	area of triangle PO_2Q		
	$= \frac{1}{2} \times 6^2 \times \sin 112.9^2$		
	$= 16.58cm^2$		
	area of shadded region		
	$= (38.98 - 24.49 + 35.47 - 16.58)cm^2$		
	$= 33.38cm^2$		
		10	

18.	$\frac{45}{x}+\frac{45}{x-0.75}$	**B1**	
	$\frac{45(x-0.75)+45x}{x(x-0.75)}$	**B1**	
	$\frac{45x-33.75+45x}{x^2-0.75x}=\frac{90x-33.75}{x^2-0.75x}$	**A1**	
	(b)		
	$\frac{45}{x}+2=\frac{45}{x-0.75}$	**B1**	
	$\frac{45+2x}{x}=\frac{45}{x-0.75}$		
	$(45+2x)(x-0.75)=45x$		
	$45x-33.75+2x^2-1.5x=45x$		
	$2x^2-1.5x-33.75=0$	**B1**	
	$x=\frac{-(-1.5)\pm\sqrt{(1.5)^2-4(2)(-33.75)}}{2(2)}$		
	$=\frac{1.5\pm\sqrt{2.25+270}}{4}$		
	$=\frac{1.5\pm\sqrt{272.25}}{4}$		
	$=\frac{1.5\pm16.5}{4}$		
	$x=\frac{1.5+16.5}{4}$ or $x=\frac{1.5-16.5}{4}$		
	$=\frac{18}{4}$	**A1**	
	$x=4.5$ or $x=-3.75$		
	Therefore makori spent sh.4.50 per orange		
	Mrs. Makori spent sh. (4.50 – 0.75)		
	= sh. 3.75		For both
	(c) no. of oranges for family that week	**M1**	
	$=\frac{45}{4.50}+\frac{45}{3.45}$	**A1**	
	$=10+12$		
	$=22$		
		10	
19.	(a)		
	$\frac{\theta}{360}\times14\times2\times\pi=11$	**M1**	
	$\theta=45^0$	**A1**	
	$(b)\ 2\pi r=11$		
	$r=\frac{11}{2\pi}$	**M1**	
	$=1.75cm$		
	(c)	**A1**	



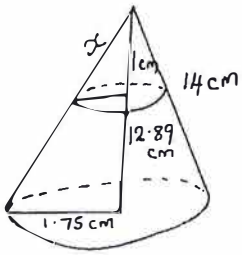
$h = \sqrt{14^2 - 1.75^2}$ **M1**

$= \sqrt{196 - 3.0625}$ **M1**

$= \sqrt{192.9375}$

$= 13.89cm$ **A1**

(d)



$\frac{x}{14} = \frac{1}{13.89}$ **M1**

$x = 14 \times \frac{1}{13.89}$ **M1**

$= 1.0079$

$= 1.01cm$ **A1**

10

20. (a)

x	-3	-2	-1	0	1	2	3	4	5	6
y	-16	-8	-2	2	4	4	2	-2	-8	-16

✓All values
B1 at least 6V values

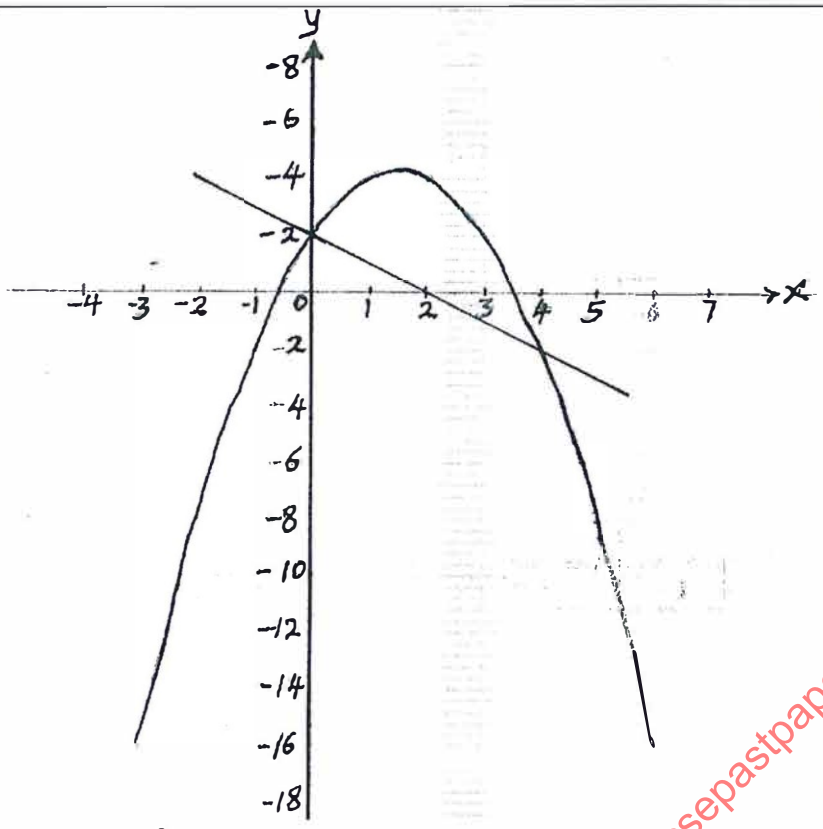
(b) (i) **B2**

S1 ✓Scale
P1 All points✓
C1 Smooth curve

B1

B1

B1



B1

✓Eqn
✓Line drawn

L1

From graph

B1

B1

$y = 2 + 3x - x^2$

$0 = \quad 4x - x^2$ -

$y = \quad 2 - x$

x	0	2
y	2	0

X=0 or 4

(ii) x=1.5

(iii) 0.5<x<3.5

10

21. (a) $100,000 in Kenya account

=sh.28.74 x 100,000

=ksh. 2,874,000 **B1**

$100,000 in UK account

$= \frac{100000}{1.79} \times 50.80$

$= 55,865.92179 \times 50.80$ **B1**

$= 2,837,988.83$ **B1**

Cheaper is through united kingdom

difference=2874000-2837988.83 **B1**

=sh.36.01

(b) Let Agnes age now be x

Three years ago Agnes x-3

Joseph three years ago 3(x-3)

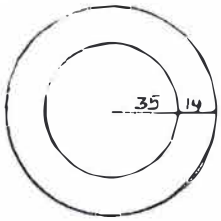
Joseph now 3(x-3)+3

In two years time Agnes (x-3) +2=x+5

Joseph 3(x-3)+3+2 **B1**

= 3x-4

(x-3)+2+3(x-3)+5=75 **M1**

	$x-3+2+3x-9+5=75$ $4x = 80$ $X = 20$ Agnes age now is 20 Josephs age now is 54	**A1**	
	(c) $3\left(\frac{1}{0.416}\right)+5\left(\frac{1}{49.27}\right)$ $3\left(\frac{1}{4.16\times10^{-2}}\right)+5\left(\frac{1}{4.927\times10}\right)$	**M1**	
	$3\left(\frac{10^2}{4.16}\right)+5\left(\frac{1}{4.927}\times\frac{1}{10}\right)$ $300\left(\frac{1}{4.16}\right)+\frac{5}{10}\left(\frac{1}{4.927}\right)$	**M1**	
	$300(0.2404)+\frac{1}{2}(0.2030)$ $72.12+0.1015$ $72.222 \quad (3d.p)$	**A1**	
		10	
22.	(a)  Area of path $\pi\times49^2-\pi\times35^2$ $=\pi(49^2-35^2)$ $=(2401-1225)\pi$ $=3694.5m^2$	**M1**	
	Area of field $=\pi\times35^2-(4\times3)\times4$ $=3800.5m^2$	**M1**	
	Total estimate =3694.5x300+3800.5x400 =1,108,350+1,520,200 =sh.2,628,550	**M1** **A1**	
	Quotation $=\frac{15}{100}\times2628550+2628550$ $=394282.5+2628550$ $=sh.3,022,832.5$	**M1** **A1**	
	Money not spent $=\frac{20}{100}\times3022832.5$ $=sh.604,566.5$	**M1** **A1**	
	(b) Actual cost of contact = sh. 3022832.5-604,566.5 = 2,418,266	**M1** **A1**	
		10	
23	(a)		

$$\begin{matrix} & A & B & C & A' & B' & C' \end{matrix}$$
$$\begin{pmatrix} 2 & 0 \\ 0 & 2 \end{pmatrix}\begin{pmatrix} 1 & 3 & 2 \\ 3 & 3 & 1 \end{pmatrix} = \begin{pmatrix} 2 & 6 & 4 \\ 6 & 6 & 2 \end{pmatrix}$$

$A'(2,6), \quad B'(6,6), \quad C'(4,2)$

B1

(i)

B1B1 ✓Diagram drwn

(ii) $area\ of\ \Delta A'B'C' = \frac{1}{2} \times 4 \times 4 = 8 Sq\ units$

M1A1

$$\begin{matrix} & A' & B' & C' & A'' & B'' & C'' \end{matrix}$$
$$(b)\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}\begin{pmatrix} 2 & 6 & 4 \\ 6 & 6 & 2 \end{pmatrix} = \begin{pmatrix} 6 & 6 & 2 \\ 2 & 6 & 4 \end{pmatrix}$$

B1

$A''(6,2), \quad B''(6,6), \quad C''(2,4)$

(i)

B1 ✓Diagram drawn

(ii) *it is a reflection* int *he line* $y = x$

B1

$$\begin{matrix} & A'' & B'' & C'' & A & B & C \end{matrix}$$
$$(c)\begin{pmatrix} a & b \\ c & d \end{pmatrix}\begin{pmatrix} 6 & 6 & 2 \\ 2 & 6 & 4 \end{pmatrix} = \begin{pmatrix} 1 & 3 & 2 \\ 3 & 3 & 1 \end{pmatrix}$$

$\Rightarrow 6a + 2b = 1$

$6a + 6b = 3$

$-4b = -2$

$b = \frac{1}{2}$

M1 ✓Attempt to solve for any one equation

$6a + \frac{1}{2} \times 2 = 1$

$6a = 0,$

$a = 0$

$\Rightarrow 6c + 2d = 3$

$6c + 6d = 3$

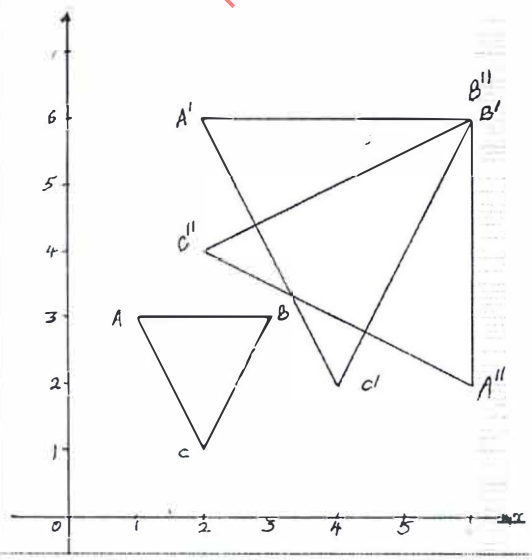
$4d = 0$

$d = 0$

$6c + 0 = 3$

$c = \frac{1}{2}$

$$\begin{pmatrix} a & b \\ c & d \end{pmatrix} = \begin{pmatrix} 0 & \frac{1}{2} \\ \frac{1}{2} & 0 \end{pmatrix}$$



A1

10

24.

Height of trees(m)	Mid point x	f	Cf	$t=\frac{x-34.5}{10}$	t^2	ft	ft^2
0-9	4.5	50	50	-3	9	-150	450
10-19	14.5	35	85	-2	4	-70	140
20-29	24.5	30	115	-1	1	-30	30
30-39	34.5	32	147	0	0	0	0
40-49	44.5	16	163	1	1	16	16
50-59	54.5	10	173	2	4	20	40
60-69	64.5	7	180	3	9	21	63
		$\sum f = 180$				$\sum ft = -193$	$\sum ft^2 = 739$

B1✓Σf

B1✓Σft

$$x = A + C\frac{\sum ft}{\sum f}$$

$$= 34.5 + \frac{10\times(-193)}{180}$$

$$= 34.5 - 10.72$$

$$= 23.78$$ **M1 A1**

$$median = \frac{\left\{24.5+\left(\frac{5}{30}\times 10\right)\right\}+\left\{24.5+\left(\frac{6}{30}\times 10\right)\right\}}{2}$$ **M1**

$$= \frac{26.17+26.50}{2} = \frac{52.67}{2}$$

$$= 26.335$$

$$(c)\ S.D = \sqrt{C^2\left(\frac{\sum ft^2}{\sum ft}\right)-\left(\frac{\sum ft}{\sum ft}\right)^2}$$ **A1**

$$= \sqrt{10^2\left\{\frac{739}{180}-\left(\frac{-193}{180}\right)\right\}^2}$$ **M1**

$$= \sqrt{100(4.106-1.150)}$$

$$= \sqrt{259.6}$$ **M1**

$$= 17.19$$ **A1**

10

121/2
MATHEMATICS
PAPER 2
MARKING SCHEME.

1

No	Log
36.72	1.5649
$(0.46)^2 \Rightarrow 2(\bar{1}.6628)$	$\bar{1}.3256+$
	0.8905
	$2.2682-$
	$\bar{2}.6223$
	$\bar{2}.6223$
	3

M1 Logs

M1 Operation

M1 Division

	3.474×10^{-1} $= 0.3474$	$\frac{\bar{3}+1.6223}{3}$ $\bar{1}.5408$		A1	
				04	
2	$= \frac{2\sqrt{3}}{1+\sqrt{3}} - \frac{\sqrt{3}}{1-\sqrt{3}}$ $= \frac{2\sqrt{3}(1-\sqrt{3}) - \sqrt{3}(1+\sqrt{3})}{1-\sqrt{3}+\sqrt{3}-3}$ $= \frac{\sqrt{3}-9}{-2}$ $= \frac{-9}{-2} + \frac{\sqrt{3}}{-2}$ $= \frac{9}{2} + \frac{\sqrt{3}}{-2} = a + b\sqrt{c}$ $a = \frac{9}{2}, b = -\frac{1}{2}, c = 3$			M1 M1 A1	
				03	
3	$y = 2x^3 - 6x + 2x^2 - 6$ $\frac{dy}{dx} = 6x^2 - 6 + 4x$ Gradient when $x = \frac{3}{2}$ $= 6 \times \left(\frac{3}{2}\right)^2 - 6 + 4 \times \frac{3}{2}$ $= \frac{54}{4} - 6 + 6$ $= 13.5$ Grad of normal $= -\frac{2}{27}$ $\frac{y-3}{x+2} = -\frac{2}{27}$ $27(y-3) = -2(x+2)$ $27y - 81 = -2x - 4$ $27y + 2x = 77$			M1 A1 M1 A1	Differentiate
				04	
4	$f = kt + m\sqrt{t}$ when $t = 4$, $f = 22$ $22 = 4k + 2m$ .....(i) When $t = 9$, $f = 42$ $42 = 9k + 3m$ .....(ii) $42 = 9k + 3m$ $14 = 3k + m$ $14 = 3k + m$ $11 = 2k + m$ $3 = k$			M1 M1	for equation dividing by 3

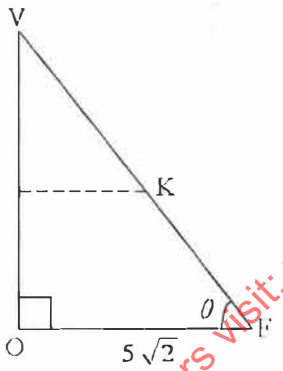
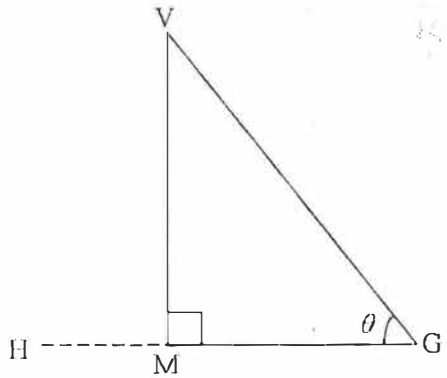
	$m = 11 - 2 \times 3 = 5$ Equation $f = 3t + 5\sqrt{t}$	A1	elimination
		03	
5	$(2 + 2x)^5 = 2^5 + 5\,(2)^4\,(2x) + 10\,(2)^3\,(2x)^2 + 10\,(2)^2$ $(2x)^3 + 5\,(2)\,(2x)^4 + \ldots\ldots\ldots$ $= 32 + 160x + 320x^2 + 320x^3 + 160x^4 + \ldots\ldots\ldots$ $(2 + 2x)^5 = (2.02)^5$ $2x = 2.02 - 2$ $2x = 0.02$ $x = 0.01$ $32 + 160\,(0.01) + 320\,(0.01)^2 + 320\,(0.01)^3 +$ $160\,(0.01)^4 + \ldots\ldots\ldots\ldots\ldots$ $= 32 + 1.6 + 0.032 + 0.00032 + \ldots\ldots\ldots\ldots$ $= 33.632$	M1 A1 M1 A1	
		04	
6	$2x^2 + 2y^2 + 6x - 10y + 7 = 0$ $x^2 + y^2 + 3x - 5y + 3.5 = 0$ Centre **A** (- 1.5, 2.5), **B** (-4, 1) $= \sqrt{(-4 - -1.5)^2 + (1 - 2.5)^2}$ $= \sqrt{(-2.5)^2 + (-1.5)^2}$ $= \sqrt{6.25 + 2.25}$ $= \sqrt{8.5}$ $= 2.9155$ units	B1 M1 A1	Correct centre
		03	
7	Fraction done by **A** and **B** in $\frac{5}{2}$ hrs $= \frac{5}{2}\left(\frac{1}{8} + \frac{1}{10}\right)$ $= \frac{9}{16}$ Remaining work $= \frac{16}{16} - \frac{9}{16} = \frac{7}{16}$ Time taken by **A** alone $\frac{7}{16} \div \frac{1}{8} = 3\frac{1}{2}$ hrs	M1 M1 A1	
		03	
8	A.S.F = det $5x^2 + 6 = \frac{110}{10}$ $5x^2 + 6 - 11 = 0$ $5x^2 = 5$ $x = \pm 1$	M1 M1 A1	For both x =1 and x = -1
		03	
9	$2\cos(2x - 30) = -\frac{6}{5}$ $\cos(2x - 30) = -0.6$ Cos –ve in 3rd quad	B1	

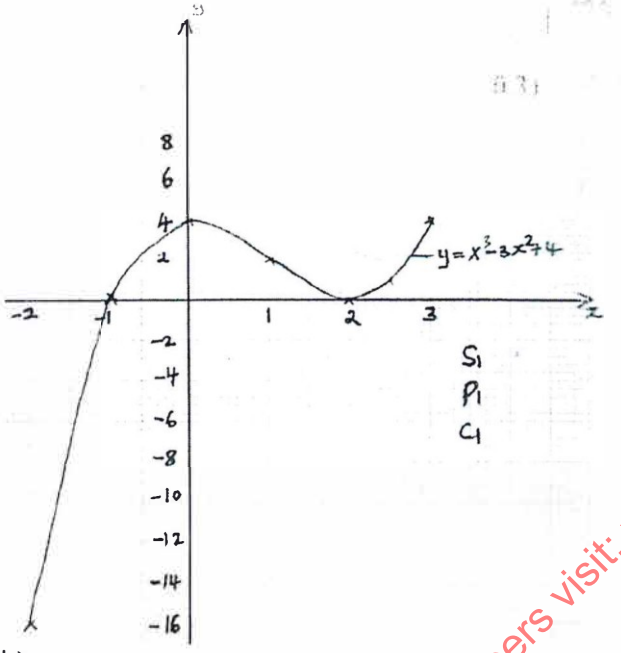
	$2x - 30 = 53.13$ $2x - 30 = 233.13$ $2x = 263.10$ $x = 131.57°$ $2x - 30° = 360 + 233.13°$ $2x = 623.13$ $x = 311.57$	B1 B1	
		03	
10	1ST year $\frac{110}{100} \times 8000 = \text{sh } 8,800$ 2nd year $\frac{112}{100} \times 8800 = \text{sh } 9,856$ $A = P\left(1+\frac{R}{100}\right)^n$ $= 9856\ (1.08)^2$ $A = \text{sh } 11,496$	M1 M1 A1	
		03	
11	$\frac{nT}{2m} = \sqrt{\frac{L-A}{3k}}$ $\frac{n^2T^2}{4m^2} = \frac{L-A}{3K}$ $4m^2(L-A) = 3k(n^2T^2)$ $4Lm^2 - 4Am^2 = 3kn^2T^2$ $A = \frac{4LM^2 - 3kn^2T^2}{4m^2}$	M1 M1 A1	
		03	
12	Absolute error = 0.05 Actual perimeter = 6.5 + 7.4 + 8.2 = 22.1 cm Max. perimeter = 6.55 + 7.45 + 8.25 = 22.25 cm Min. perimeter = 6.45 + 7.35 + 8.15 = 21.95 $\%\text{ error} = \frac{1}{2}\left(\frac{22.25-21.95}{21.1}\right) \times 100\%$ $= \frac{0.3}{44.2} \times 100\%$ $= 0.679\ \%$	B1 M1 A1	
		03	
13	$\frac{5m-2n}{2m-n} = \frac{7}{5}$ $5(5m - 2n) = 7(2m - n)$ $25m - 10n = 14m - 7n$ $11m = 3n$ $\frac{m}{n} = \frac{3}{11}$ $m : n = 3 : 11$	M1 M1	

		A1	
		03	
14	$2y + 3x = 6$ $y = -\frac{3}{2}x + 3$ gradient $= -\frac{3}{2}$ gradient $= \frac{2}{3}$ $\text{Tan}^{-1}\frac{2}{3} = 33.69°$	M1 A1	
		02	
15	Bus time $= \frac{280}{x}$, matatu $= \frac{280}{x+20}$ $\frac{280}{x} - 1.6 = \frac{280}{x+20}$ $280(x+20) - 1.6x(x+20) = 280x$ $16x^2 + 320x - 56000 = 0$ $x = \frac{-320 \pm \sqrt{320 + 4\times16\times56000}}{2\times16}$ $= \frac{-320 \pm 1920}{32}$ $= 50$ Bus speed = 50km/h	M1 M1 A1	Equation Factorization
		03	
16	$\angle DCB = 180 - 63 = 117°$ $\angle DAB + \angle DCB = 180°$ ($\angle$s in cyclic quad) $\angle DAB = 180 - 117$ $= 63°$ $\angle ADB = 90°$ $\angle DBC = 180 - (63 + 90°)$ $= 27°$	B1 B1	
		02	

SECTION B

17	Taxable income per year $= K£ \frac{(20640 + 6800 + 2800)\times12}{20}$ $= K£ 18144$	M1 A1	
	1st slab 1980 x 2 sh. 3960 2nd slab 1980 x 3 sh. 5940 3rd slab 1980 x 5 sh. 9900 4th slab 1980 x 7 sh. 13860 5th slab 1980 x 9 sh. 17820 Remaining slab 8244 x 10 sh. 82440	M1 M1	
	Total gross tax = sh. 13920p.a	M1 A1	

	Gross tax per month $= \frac{133920}{12}$ $=$ sh. 11, 160 p.m Less relief = sh (11, 160 – 400) = 10 760 p.m Total deduction $= \left(10760 + 300 + \frac{2}{100} \times 20640\right)$ = sh. 11472.80 Net pay = sh(30240 – 11472.80) = sh. 18767.20 p.m	M1 M1 M1 A1	
		10	
18	a) $\frac{h+9}{h} = \frac{10}{4}$ 4h + 36 = 10h 6h = 36 h = 6 Height = 6 + 9 = 15cm	M1 A1	
	b)  $OF = \frac{1}{2}\sqrt{10^2 + 10^2}$ $OF = 5\sqrt{2}$ $\text{Tan } \theta = \frac{15}{5\sqrt{2}} = 2.121$ $\angle VFO = 64.76°$	M1 A1	
	c) Translate EF to HG  $\angle VGH = \angle VGM$ $VM = \sqrt{15^2 + 5^2}$ = 15.814 cm	M1 M1 A1	

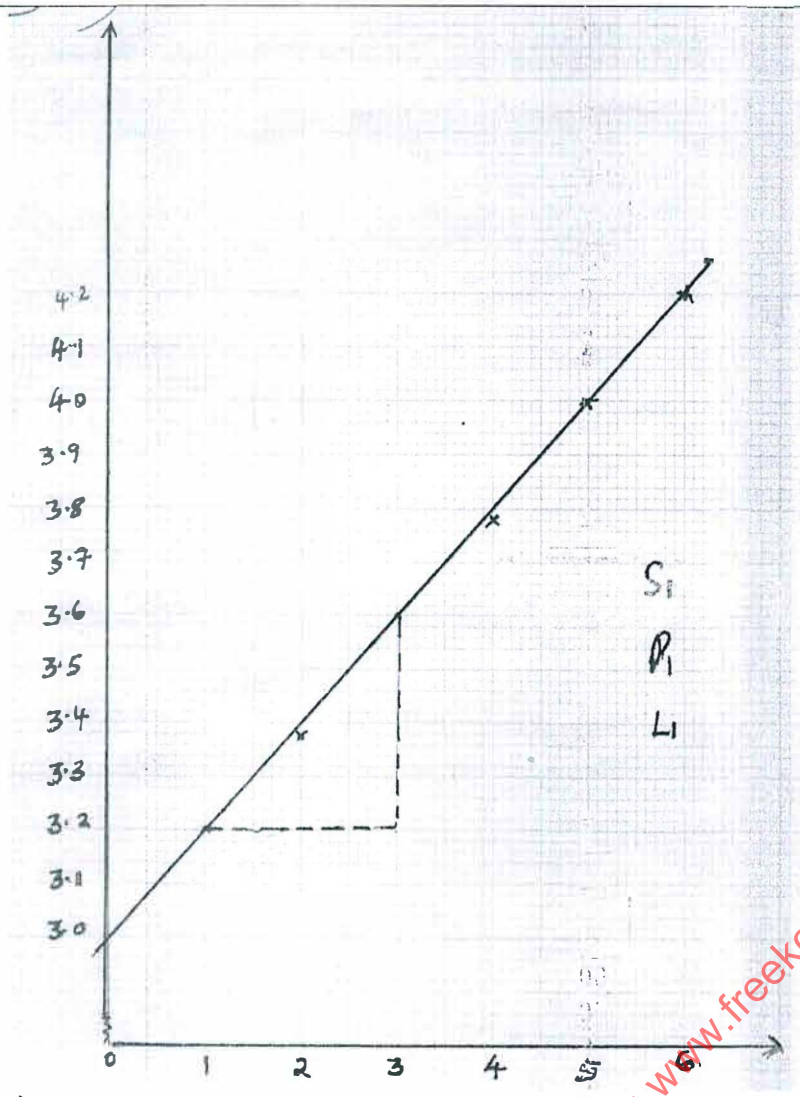
	Tan θ = $\frac{15.814}{5} = 3.162$ ∠VGM = 72.45° d) $\frac{1}{3} \times 10 \times 10 \times 15 cm^3 - \frac{1}{3} \times 4 \times 4 \times 6\ cm^3$ = 468 cm^3	M1M1 A1	
		10	
19	a) $y = x^3 - 3x^2 + 4$ x: -2, -1, 0, 1, 2, 3, 2.5 y: -16, 0, 4, 2, 0, 4, 0.875  b) x: -0.75, -0.25, 0.25, 0.75, 1.25, 1.75 y: 1.5, 3.4, 3.8, 2.6, 1.4, 0.3 Area = 0.5 (1.5 + 3.4 + 3.8 + 2.6 + 1.4 + 0.3) = 6.5 sq. units c) Exact area = $\int_1^2 (x^3 - 3x^2 + 4)dx$ $= \left[\frac{x^4}{4} - x^3 + 4x\right]_1^2$ $= \left(\frac{16}{4} - 8 + 8\right) - \left(\frac{1}{4} + 1 - 4\right)$ $= 6\frac{3}{4}$ sq. units d) error = 6.75 – 6.5 = 0.25	B1 B1 M1 A1 M1 A1 B1	

	% error $= \frac{0.25}{6.75} \times 100 = 3.704\ \%$		
		10	
20	a) $131° + 49° = 180°$ b) (i) $60 \times \propto \text{Cos}\theta$ $= 60 \times 180° \times \cos 36°$ $= 60 \times 180 \times 0.8090$ $= 8737.38\text{nm}$ (ii) $\frac{\alpha}{360°} \times 2\pi R\cos\theta$ $\frac{180}{360°} \times 2 \times \frac{22}{7} \times 6370\cos 36°$ $= 16192.103\ \text{km}$ c) $\frac{\alpha}{360} \times 2 \times \frac{22}{7} \times 6370\cos 36° = 840km$ $\alpha = \frac{840 \times 360°}{628 \times 6370\cos 36°}$ $\alpha = 9.34°$ Longitude of town **C** $131° - 9.34°$ $= 121.66°$	B2 M1 A1 M1 A1 M1 A1 M1 A1	Accept answers in (i) divided by 1.853
		10	
21	$B = CA + KA^2$ $\frac{B}{A} = C + KA$ Plot $\frac{B}{A}$ against A C= y – intercept K = gradient		

A	1	2	3	4	5	6
B	3.2	6.75	10.8	15.1	20	25.2
$\frac{B}{A}$	3.2	3.375	3.6	3.775	4.0	4.2

B2 All correct values

B1 3 and more correct



S1

P1

L1

B1

M1 A1

B1

a)

C = 3.0

$K = \frac{3.6 - 3.2}{3 - 1} = \frac{0.4}{2} = 0.2$

B1

b)

$B = 3A + 0.2A^2$ or $B = 3A + \frac{1}{5}A^2$

c)

$B = 3 \times 7 + 0.2 \times 7^2$

$= 21 + 9.8$

$= 30.8$

10

22

Marks	f	x	d x-A	fd	d^2	fd^2
1-10	4	5.5	-40	-160	1600	6400
11-20	6	15.5	-30	-180	900	5400
21-20	7	25.5	-20	-140	400	2800
31-40	5	35.5	-10	-50	100	500
41-50	x	45.5	0	0	0	0
51-60	9	55.5	10	90	100	900
61-70	3	65.5	20	60	400	1200
71-80	5	75.5	30	150	900	4500

81-90	2	85.5	40	80	1600	3200
91-100	7	95.5	50	350	2500	17500
		$\Sigma fd=$		$\Sigma fd=200$		$\Sigma fd^2=42,400$

B2

a) (i)

$45.5 + \frac{200}{x+48} = 49.5$ M1

$\frac{200}{x+48} = 4$ M1

$200 = 4x + 192$ A1

$x = 2$

(ii)

$S = \sqrt{\frac{\sum fd^2}{\sum f} - \left(\frac{\sum fd}{\sum f}\right)^2}$ M3

$= \sqrt{\frac{42400}{50} - \left(\frac{200}{50}\right)^2}$ A1

$= \sqrt{848 - 16}$ M2

$= \sqrt{832}$

$= 28.82$ A1

(iii)

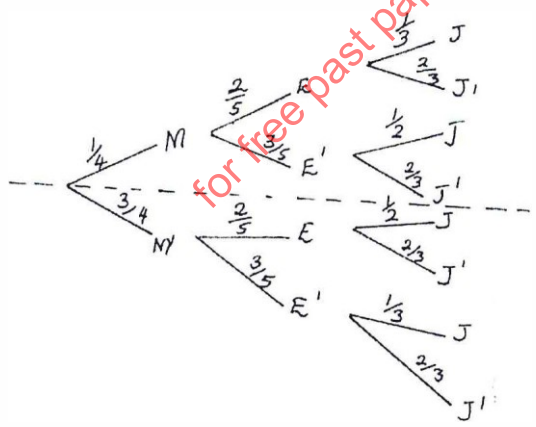
Both values

$\left[30.5 + \frac{3}{5} \times 10\right]$

$= 36.5$

12

23 a)



B1 1st half with probabilities

B1 2nd half with probabilities

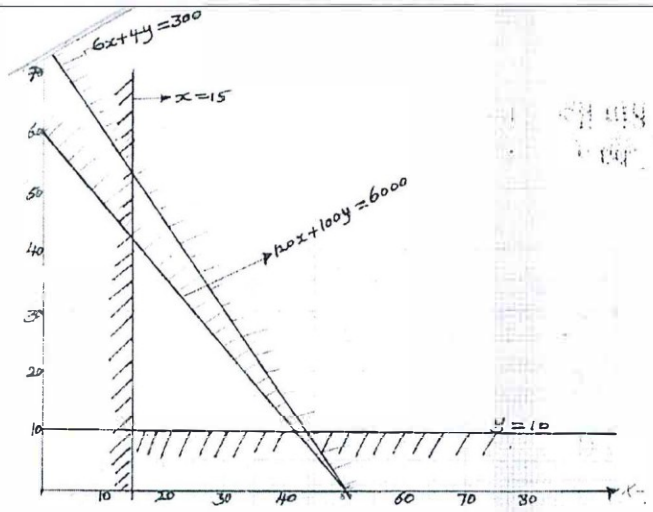
b) (i) P (all late) $= \frac{1}{4} \times \frac{2}{5} \times \frac{1}{3}$ M1

$= \frac{2}{60}$

$= \frac{1}{30}$ A1

(ii) P (all except E) $= \frac{1}{4} \times \frac{3}{5} \times \frac{1}{3}$ M1

	$= \frac{3}{60}$ $= \frac{1}{20}$	A1 M1	
	(iii) P (at least one late) $\left(\frac{1}{4} \times \frac{2}{5} \times \frac{1}{3}\right) + \left(\frac{1}{4} \times \frac{2}{5} \times \frac{2}{3}\right) + \left(\frac{1}{4} \times \frac{3}{5} \times \frac{1}{3}\right) +$ $\left(\frac{3}{4} \times \frac{2}{5} \times \frac{1}{5}\right) + \left(\frac{3}{4} \times \frac{2}{3} \times \frac{1}{3}\right)$ $= \frac{3}{30} + \frac{4}{20} + \frac{2}{10} + \frac{1}{5}$ $= \frac{21}{30}$ $= \frac{7}{10}$	 A1 M1 A1	
	OR 1 – (P none is late) $1 - \left(\frac{3}{4} \times \frac{3}{5} \times \frac{2}{3}\right)$ $= \frac{7}{10}$	 M1	
	(iv) P (at most 2) 1 – (P all late) $= 1 - \left(\frac{1}{4} \times \frac{2}{5} \times \frac{1}{3}\right)$ $= 1 - \frac{1}{30}$ $= \frac{29}{30}$	 A1	
		12	
24	a) $6x + 4y \leq 300$ $x \geq 15$ $y \geq 10$ $120x + 100y \leq 6000$ b)	 B1 B1 B1 B1 B1 B1 B1	Both inequalities Shading of each of the lines

	 c) point (15, 42) x = 15, y = 42 max. profit (15 x 80) + (42 x 60) 1200 + 2520 Sh. 3720	B1 M1 A1	
		10	

ENGLISH
PAPER1
MARKING SCHEME

Q 1 (a) Must be a journal, if not deduct 2 AD

Format

- Day,
- Date - 1 mark per each entry (3 marks)

Content

- 2 marks for each entry
- expect 3 entries 2 x 3 = 6 marks
- Each day should contain vivid descriptions of evens; experiences, options, feelings and impressions.
- Must come out if deduct 1 mark

Tone – 2 marks
Language = 2 marks

Total 13 marks

(b) The shopping must include

- Item
- Amount
- Price
- Title and date =1 mark
- At least four entries items =4 marks

- Frame/columns = 1 mark
- Total amount = 800
- NB. Should not exceed eight hundred shillings = 1 mark

Total 7 marks

Q2 ***Cloze Test (10 Marks)***

1	a	6	However
2	mere	7	Since
3	story	8	dimension
4	waters	9	Option
5	for	10	Whether

Q3 (a) - to draw attention of the audience
- It indicates that the story has begun (2 marks)

(b) – rehearse before a mock audience
- consider the audience, age, gender, education, background
- groom well
- use appropriate costumes

(Accept anyrelevant 4points) 1 mark each

(c) (i) falling intonation✓1 mark
(ii) falling intonation ✓ 1 mark

(d) – encourage the shy ones to participate fully
- ensure members keep their feelings undercontrol and not show off
- Turn – taking-give each member a chance to talk
- ensure polite interruptions when necessary
-ensure that members stick to the topic
- plan time i.e time management
- members to channel questions through the leader
-maintaining order

(Any relevant points – 1 mark each)

(e)i) lessen
ii) maul
iii) sweet
iv) blew
v) itch (1 mark each)

(f)

/ʃ/	/dʒ/	/tʃ/	0 / /	/ð/
share	jug	chores	thin	thy

parachute	judge	arch	thigh	this

(½mark each = 5 marks)

(g)

John: I am fine dad! ✓1

John: Yes dad!✓1 I have scored a mean grade of 'A'✓1

John: Not medicine! ✓1 I would like to study music✓1

John: My passion is music✓1 OR I have always wanted to be a musician✓1

(6 marks)

ENGLISH-
MARKING SCHEME
Paper - 101/2
July/August 2018

1. The author's main argument is our reasons for spending most of our money in developing urban centres while we neglect the village □2 (2mks)

b) Money obtained from urban and industrial development □ (1) and money obtained from foreign currency□ (1)/ money obtained the sale of exports.(2mks)

c) The town people enjoy the use of big hospitals,□ (i a) tarmac roads, □(i b) electric lights,□ (i c) water pipes, □(i d) hotels□ (i e) and other aspect of modern development□(i f) yet the foreign exchange with which all these are provided comes from the sale of the farmer's produce. (6mks)

(Responses must be in continuous prose, if not deduct 1/2 mark from each point in not form

d) Challenges facing Tanzania government. (2mks)

- Lack of enough money to bring the kind of development to each village, which would benefit everybody.□ (1)
- Inability to establish an industry in each village and through this means effect a rise in the real incomes of the people □(1)

e) Metaphor□ (1) large and small fish refer to ordinary citizens/individuals and those in authority □(1). The large fish eating small ones shows how the ordinary citizens are exploited by those in authority.
(3mks)

f) Carrying the burden of loan repayment (1) it is an element of exploitation (1)
(2mks)

g) We must not forget that those people who live in rural areas can possibly be (can be possibly) exploited by those who live in towns.□ (1).
(1mk)

h) Meaning of words. (2mks)

i) Up to now/until now □(1)

ii) Remembered/considered □(1)

2. The River and the source.

a) Simon Onyancha (½mk) and Paul Omondi Rakuta (½mk)

Nobody moves towards the kit of instruments at first (½mk)

Wandia makes as if to grab it but Aoro reaches it first (½mk)

The other four are scared to immobility (½mk)

Wandia eases the tension by requesting that they introduce themselves. (½mk)

b) Both are fighters/determined (1mk) to get the best grades in anatomy. "Two people were fighting for the top position in anatomy.....Aoro Sigu and Wandia Mugo.
c) Determination - (1mk) the students are determined to pass anatomy so they read and memorize." If you saw a medic mumbling, the poor guy was practising anatomy" (1mk)
d) Irrespective of whether one had managed to identify the previous one or not, one had to move to the next item each time the bell rang. (2mks)
e) The science that firmly grounded the image of the human body into the doctor's head.
- The cornerstone of medicine.
- A test of one's power of recall.
f) Tony, Aoro's brother's appendix was incised and removed. He was fascinated and he examined the incision carefully and later catches a frog and does an operation on it with an old blade. He then stitches the wound with a needle he had taken from his mother's sewing basket.
g) Mood of anxiety - (1)" ..... medic mumbling to himself" "people slept with their Cunningham's manuals" "you could cut the tension with a knife.
h) Biblical allusion (1mk) words of Jesus Christ to His disciples to emphasize on the importance of gathering together in order to enjoy His presence. (1)
The author thus suggests that anatomy is central/important to the students. It forces them to discuss it whenever they are together. (1mk)
i) Wandia Mugo beats Aoro by one point. (1m)

She scores 78 points while Aoro scores 77 points. (1mk)
j) Obvious/clear/easily noticed.

3. POETRY

a) Parent/mother/father 1mk - Identify

iv) Little did I know that there was trouble ahead.
b) 1a) The man sitting on the chair has a broken leg.
b) The chair the man is sitting on has a
Dear son
Believe me son 1mk Illustration
Show me son
b) People used to be friendly but now they are not. People had feelings for each other but now they don't. People have become hypocritical / Genuine love has disappeared.
(3 mks)
c) Metaphors - Laugh with teeth ice cold eyes
Shake hands without hearts
Simile - Live fixed portraits smile
- Like dresses
(2mks)
d) Repetition - "tough" to emphasize the fake laughter and the genuine laughter. (2mks)
Alliteration - hands hearts
- face face
(2mks)
(Make poem musical) (Any 2 relevant devices)
e) i) Mechanical smile (1)
ii) I want to change from this insincerity to sincerity (1)
iii) Insincere laughter (1)
f) Cordial/friendly/ close/open (1)
- Father pours out his heart to the son (1)
g) Nostalgic (2) once upon a time (1)
Bitter (2) father not happy (1)
h) Lost love (1) any other appropriate (1)
(Any relevant tone)

4. GRAMMAR

a) i) Never before had the school performed well.
ii) No other mountain in Africa is higher than mount Kilimanjaro./Mount Kilimanjaro is higher than any other mountain in Africa.
iii)-Not only have the residents succeeded in cleaning up the estate but also made it the cleanest in the entire region.
- The residents have not only succeeded in cleaning up the estate but also made it the cleanest in the entire region.

broken leg.
iia) It is interesting to watch monkeys as they eat.
b) The act of eating monkey meat is interesting.
c) Replace the underlined words with a phrasal verb formed from the word in brackets.
i) All his friend were at the airport to see him off.
ii) Simon was taken aback by the news of the closure of Nakumatt supermarket.
d) Preposition - i) from
ii) with, of
e) i) scandalous
ii) lain
f) i) needn't we?
ii) will you?
NB// The tag must start with a small letter and have a question tag at the end.

MTIHANI WA MWISHO WA MUHULA WA PILI
Hati ya Kuhitimu Elimu ya Sekondari Kenya
KISWAHILI - INSHA
Karatasi - 102/1
Julai/Augosti 2018

MWONGOZO WA KUSAHIHISHA
Swali la kwanza.
Hii ni insha ya mahojiano.
Sura.
1. Kichwa - Kiandikwe kwa herufi kubwa na kipigiwe mstari.
2. Yafuate mtindo wa tamthilia : pawe na majina ya wahusika.
3. Yafuate mtindo wa utangulizi, mwili na hitimisho.

Hoja
1. Kufukuzwa shuleni.
2. kufungwa jela kwa watapeli, walimu, wazazi n.k.
3. kutopata matokeo / majibu.
4. kupigwa faini.
5. heshima ya utaifa kukosekana.
6. kulemewa na masomo ya vyuo vikuu.
7. kupata wataalam ghushi waliokosa umilisi.
8. kupunguza dhamani ya mtihani wa kitaifa.
9. ukosefu wa usawa/ushindani usio sawa.
10. uzembe miongoni mwa wanafunzi.
11. wanafunzi kutapeliwa.
12. kudanganywa na kupewa mitihani ghushi.
13. serikali kupoteza fedha nyingi.

Swali la pili.
1. kufungwa jela.
2. kuozwa faini.
3. ushauri nasaha
4. sheria kali dhidi ya wale wanaowahusisha vijana katika ukiukaji wa maadili - panografia.
5. kuwajibika kwa wazazi - malezi bora.
6. dini - kutoa ushauri.
7. kuandaa warsha na kuhamasisha vijana katika shughuli zinazokuza maadili.
8. Tamaduni - kuhifadhi tamaduni zinazounga maadili.
9. Kupunguza umaskini unaochochea vijana kukosa vitu vya.
10. Kimsingi na kujiingiza kwenye maovu.
11. Wakubwa kwa mifano bora miongoni mwa vijana.
12. Walimu kifufilia ni dhamu miongoni mwa vijana.
13. Kuweka kiasi na kutowapa vijana uhuru usio na mipaka-matumizi ya simu n.k.

Tanahahi
Mtahiniwa lazima ataje visa vya utovu wa maadili na kuoanisha hoja yake na suluhisha lenyewe.
Asipofanya vile asituzwe zaidi ya C. maki 8.

Swali la tatu.
1. Hili ni swali la methali.
2. Mtahiniwa ashughulikie pande zote mbili za methali.
3. Atunge kisa kinacholenga matumizi ya methali.

Mfano
a) Mzazi apuuze kutomrudi mtoto wake aliyepotoka mwishowe mtoto apatane na maafa katika maisha. Mzazi mwenyewe aathirike kutokana na jambo hili.
b) Mwalimu akose kumrudi mwanafunzi shuleni, mtoto aanguke mtihani au ajiingize kwenye visa vya utovu wa nidhamu. Jambo hili limrudie mwalimu na kuwathiri mwenyewe.
c) Katika viwanda /kampuni, wakurungenzi kukosa kuwarekebisha wadogo wao katika

visa vya ufisadi. Viwanda viporomoke na kuwathiri mkurugenzi baadaye.

Swali la nne

1. Mnenaji asawiriwe aking'ang'ania kufanya jambo walilopata na wenzake.
2. Wenzake hawafanyi vile.
3. Ndiye tu anaendelea na jambo hilo.

Mfano.

1. Mtahniwa ajipate katika hali ambapo alipotezwa na wenzake ambao wamekuwa wakitia bidii masomoni ilhali yeye hana shughuli yoyote masomoni. Mwishowe afeli na wenzake wapite.
2. Yeye ajipate anatumia vileo na dawa zingine ilhali wengine hawatumii.

MTIHANI WA MWISHO WA MUHULA WA PILI
Hati ya Kuhitimu Elimu ya Sekondari Kenya
KISWAHILI
Karatasi - 102/2
Julai/Augosti 2018
MWONGOZO WA KUSAHIHISHA

A. UFAHAMU.

a) Alisingiziwa kuumua mtu.
1 × 2 = 2
b)- Wafungwa hudhulumiwa.
- kuna uvundo
- hakuna hewa safi.
- watu hawaogi.
- kuna giza na joto
- kuna rundo la wafungwa (msongamano)
1 × 4 = 4
c) Wasomi ambao wamepewa majukumu ya kuwakilisha raia ndio wanaowadhulumu.
1 × 2 = 2
d)- Hakuamini alikuwa kweli kuachiliwa huru.
- Alihofia kuamriwa asimame.
- Alihofia kushukiwa bunduki
1 × 3 = 3
e) i) Mwema
ii) Mwadilifu
iii) Mkweli
Mtahiniwa lazima afafanue.
1 × 2 = 2
f) i) Kitu kilichowazi
ii) Hamu kubwa ya kufurahia kitu
Makosa.
Ondoa ½ alama kwa kila kosa la sarufi hadi makosa 6 = 6 × ½ = jumla alama 3
Ondoa alama ½ kwa kila kosa la hijai hadi makosa

6 = 6× ½ = Jumla = 3

2. UFUPISHO (mwongozo)

1.
a) Suala la nidhamu ni nyeti ulimwenguni.
b) Mungu aliumba mwanandamu kamili.
c) Mtu alipokosea Mungu alimwadhibu
d) Mungu alimpa mwanadamu msaidizi alyemfaa.
e) Adhabu ya mwanamume ni kufanya kazi ngumu.
f) Adhabu ya mwanamke ni kujifungua kwa uchungu.
g) Nyoka alifaa kugongwa kwa kichwa.
h) Mungu aliwajalia watu wake nafasi nyingine kwa kumtuma Yesu Kristu aje kuwaokoa.
i) Ni vyema kuchunguza chanzo cha kitendo kabla ya kutoa adhabu yoyote.
hoja 9 - alama 9
mtiririko - alama 1
Jumla alama 10

2.
a) Uzito wa kosa.
b) Kilichosababisha kosa kufanyika.
c) Athari ya adhabu kwa mhusika.
d) Chanzo cha kosa lililotendwa
Hoja 4 - alama 4
Mtiririko - alama 1
Jumla - alama 5
M a - 9

b - 4
utiriko - 2
15
1
2
Makosa
Ondoa ½ alama kwa kila kosa la sarufi hadi makosa 6
Jumla = 6 × ½ = alama 3
Ondoa ½ alama kwa kila kosa la hijai hadi makosa 6
Jumla = 6 × ½ = alama 3

3. MATUMIZI YA LUGHA

a) /u/ sauti ya njuma ½
ulimi huwa juu ½
midomo huviringwa
/ch/ ni kipasuo kwamizo ½
ni ya kaakaa gumu ½
ni hafifu /sighuna
alama 2

b) i - gwa ½ i - kki ½
oa1 O-a½ i- i½

c) Gari liangukalo si lile ulizungumzialo
alama 2

d) Utepetevu. ***alama 1***

e) " **Tu**takusaidia ikwia u**ta**dhirikiana nasi."
afisa wa usalama akasema.
6 × ½ = 3

f) S □□KN + KT
KN □□W + S
W □□Letu
S □□lililopaliliwa
KT □□limetuletea
N □□mazao
V □□mengi

g) Yule mtoro - kirai kivumishi
Katikati ya barabara - kirai kihusishi
Kila wakati - kirai kielezi
Mwanafunzi yule mtoro - kirai nomino.
alama 3

h) Chaka - mwitu / enco lenyc miti mingi.

Shaka - wasiwasi
Sentensi moja na maana zidhihirike.
alama 2

i) Sahibu - rafiki
Kisunzi - kizunguzungu ***alama 2***

j) Mwanafunzi atakuwa ameandika insha nzuri.
alama 2

k) Vitoto vimefunga vilango vya vijumba vyao.
alama 2

l) Kufungia maelezo ya ziada / pembeni.
- Kufungia herufi na nambari.
- Katika tamthilia kufungia maelekezo
- Kufungia neno ambalo ni kisawe.
- Kufungia maelezo ambayo ni ufafanuzi wa jambo lililotajwa.
zozote 2 = alama 2

m) Fungu la maneno lenye muundo wa kiima kiarifu ambalo limo ndani ya sentensi.
alama 1

n) I. Sokota
II. Peka ***alama2***

o) Shamisho kipozi / yambwa tendwa - nyumba.
Shamirisho kitondo / yambwa tendewa - Babu
Chagizo - kwa mawe. ***alama 3***

p) Mwana alishangiliwa matokeo yake na mzazi.
- Mwana alishangiliwa matokeo na mzazi
- Mwana alishangiliwa matokeo na mzaziye.
alama 2

q) Kanga - mnyama

Kanga - aina ya vazi/ leso.
alama 2

r) Ukiniita - nitaandamana nawe
alama 2

s) Amewasili - kitenzi halisi.
alama 1

4. ISIMU JAMII

1. Uwili lugha.
- Hali ambapo mzungumzaji anaweza kutumia lugha mbili zilizo tofauti. ***alama 2***

Uwingi lugha.
- Hali ambapo mzungumzaji anaweza kutumia lugha nyingi katika mawasiliano.
alama 2

2.

i) Kuwa na umilisi wa lugha mbili au zaidi.
ii) Kukosa msamiati mwafaka wa kutumia

katika lugha anayoitumia wakati huo.
iii) Ili kujitabulisha na kundi moja la watu.
iv) Ili kuficha maana kutoka kwa kundi la watu.
v) Kuonyesha ubingwa au umahiri wa lugha mbalimbali.
vi) Kuonyesha hisia fulani
vii) Kutaka kueleweka zaidi.
viii) Kutaka kushirikisha watu katika mazungumzo.
ix) Kutokana na mazoea ya mtu.
Hoja za kwanza 6 × 1 = 6
Makosa
Sarufi 4 × ½ = alama 2
Hijai 4 × ½ = alama 2

CHEMISTRY
PAPER 1
233/1
CONFIDENTIAL
MARKING SCHEME

1. $\frac{92.2 \times 28.0}{100} + \frac{4.7 \times 29.0}{100} + \frac{30 \times 31.0}{100}$ ✓1
   $= 25.816 + 1.363 + 0.930$ ✓1
   $= 28.108$ ✓1

2. Add water to the mixture ✓1 KCl dissolves ✓ ½ while CUO does not ✓ ½ Filter ✓ ½ and heat the filtrate to dryness ✓ ½

3. Let oxidation no of chlorine be x
   (i) $2x + 7(-2) = -2$ ✓ ½
   $2x + -14 = -2$
   $2x = 12$
   $X = +6$ ✓ ½
   (ii) Let oxidation no of sulphur be x
   $2 + x + 4(-2) = 0$ ✓ ½
   $2 + x - 8 = 0$
   $X = +6$ ✓ ½

4. a) Bulb lights ✓1 $Cl_{2(g)}$ dissolves in water forming H^+ & Cl^- ✓ ½ ions
   The ions conduct electricity ✓ ½
   b) $2H^+_{(aq)} + 2e \longrightarrow H_{2(g)}$ ✓1

5. a) A reaction between two soluble salts to give one soluble and one insoluble salt (ppt) ✓1
   b) Add lead (II) nitrate to sodium sulphate ✓
   Filter to obtain lead (II) sulphate ppt as residue ✓1

6. (i)To expel the air in the combustion tube and prevent it from reacting with magnesium ✓1
   (i) Hydrogen ✓1
   (iii) $Mg_{(s)} + H_2O_{(g)} \longrightarrow MgO_{(s)} + H_{2(g)}$ ✓1

7. a) $4(C\text{-}H) + (Cl\text{-}Cl) \longrightarrow 3(C\text{-}H) + C\text{-}Cl + H\text{-}Cl$
   $4x414 + 244 + 3(-414) + -326 + -431$ ✓1
   $414 + 244 - 326 - 431$
   $= -99KJ$ ✓
   OR:
   Bonds broken = C-H + Cl – Cl
   $+414 + 244 = +658$
   Bonds formed C-Cl + H – Cl
   $-326 - 431 = -757$
   $\Delta H = -99KJ$ ✓1 (✓1)
   b) Presence of sunlight (UV) ✓
8. a) F & H ✓1

Reaction between strongest base (F) and strongest acid (H) will produce the highest heat of Reaction✓1

b) G✓1

9. a) ⇒208 + 2 x 4 + 0 = 216✓1

m ⇒82 + 2 x 2 + -1 x 2 = 84✓1

10. a) Calcium carbonate/ magnesium carbonate ✓1

b) Washing with weak acid solution such as methanoic acid✓1

c) –helps in forming strong teeth & bones

- does not dissolve lead pipes
- good for brewing & tanning industry

11. I No effect✓ ½ no change in volume✓ ½

II eqb shifts to the right ✓ ½ since forward rxn is endothermic

12. $1dm^3 \Rightarrow 1.52g$

$22.4dm^3 \Rightarrow \frac{1.52 \times 22.4}{1}$ ✓1

$= 34.048$ ✓1

13. a) Sodium chloride saturated with Ammonia✓ ½

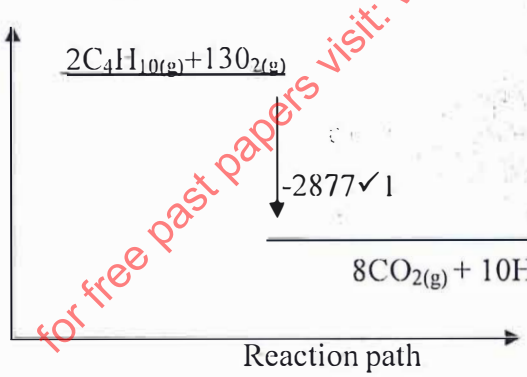
b) Heating limestone/calcium carbonate ✓ ½

c) I. $NH_{3(aq)} + CO_{3(aq)} + H_2O_{(l)} \longrightarrow NH_4HCO_{3(aq)}$ ✓1

d) II. $NH_4HCO_{3(aq)} + NaCl_{(aq)} \longrightarrow NH_4Cl_{(aq)} + NaHCO_{3(s)}$ ✓1

14. a) $2C_4H_{10(g)} + 13O_{2(g)} \longrightarrow 8CO_{2(g)} + 10H_2O_{(l)}$ ✓1

b)



Energy KJ products below reactants✓

15. a) Blue solution – copper(II) nitrate ✓1

Green solution – iron (II) nitrate ✓1

b) $Cu^{2+}_{(aq)} + S^{2-}_{(aq)} \longrightarrow CUS_{(s)}$ ✓1

16. I. Dative – bond formed when one atom donates the electrons to be shared between non-metals e.g. CO or NH^+_4✓ ½

II. ionic –union between a cation & Anion which results in transfer of electrons ✓ 1

e.g. NaCl KCl e.t.c. ✓ ½

17. Mass of C = $\frac{12}{44} \times 2.64 = 0.72g$ mass of H = $\frac{2}{18} \times 0.99 = 0.11$✓ ½

Mass of O = 1.71 – (0.72 + 0.11) = 0.88g ✓ ½

Element	R.A.M	mass	moles	Ratio	
C	12	0.72	$\frac{0.72}{12} = 0.06$	$\frac{0.06}{0.055} = 1$	Ef = CH_2O ✓ ½
H	1	0.11	$\frac{0.1}{1} = 0.11$	$\frac{0.11}{0.055} = 2$	
O	16	0.88	$\frac{0.88}{16}$ = 0.055 ✓ ½	$\frac{0.055}{0.055} = 1$ ✓ ½	

a) Rate of diffusion of a gas is inversely proportional to the square root of its density at constant temp & pressure

18 a) Rate of diffusion of a gas is inversely proportional to the square root of its density at constant temp. & pressure .

b) Rate of $SO_2 = \frac{100}{20} = 5cm^3/s$ ✓ ½

$$\frac{RSO_2}{RO_2} = \sqrt{\frac{RMMO_2}{RMMSO_2}}$$

$$\frac{5}{RO_2} = \sqrt{\frac{32}{64}} \quad \checkmark^1/_2$$

$$\frac{25}{RO^2{}_2} = \frac{1}{2} \quad \checkmark ½$$

$RO^2{}_2 = 50$ ✓

$RO_2 = \sqrt{50} = 7.1cm^3/s$

1 sec = 7.1 cm^3

30 sec = 30 x 7.1 ✓ ½

= 213.0 cm^3 ✓ ½

19. a) Metals react by losing ✓ ½ the valence electrons. the remaining electrons are strongly attracted to the nuclear/ effective nuclear charge increased

b) Increase in no of energy levels ✓1

c) Effective nuclear charge is stronger in ca^{2+} than K^+ hence outermost energy level in Ca^{2+} is stroger attracted leading to decrease in size ✓ ½

20. A ✓1

Fine powder has the largest surface area ✓1

21. No ✓ ½ .The water contains Ca^{2+} ions ✓ ½ which will react with the soapy✓ ½ detergent to form scum✓ ½

22. Mass of burnt ethanol = 4.9 – 4.4 = 0.5g ✓ ½

ΔT = 45 – 25 = 20K✓ ½

Molar mass of Ethanol CH_3CH_2OH=46

Heat change H = $MC\Delta T$

= 100 x 4.2 x 20 = 8400J ✓ ½

0.5g liberates 8.4 KJ

46g liberates $\frac{8.4 \times 46}{0.5}$ = 772.8 KJ✓ ½

ΔH^0_c = -772.8KJ/mol ✓ 1 MUST be –ve

23. a) increase in pressure (2 – 3atm) ✓1
b) presence of V_2O_5 catalyst✓1 any two
c) low temp (450^0C)

24. (i) Reaction between ammonia and air which takes place on the surface of the wire is exothermic✓1
(ii) $4NH_{3(g)} + 5O_{2(g)} \xrightarrow{pt} 4NO_{(g)} + 6H_2O_{(g)}$ ✓1
(iii) Nitrogen (iv) oxide/NO_2✓1

25. a) $\frac{Y - Z}{Y} \times 100$ ✓1
b) Readily absorbs $CO_{2(g)}$ formed✓1

26. a)
i) $CuO_{(s)} + H_2SO_{4(aq)} \longrightarrow + CuSO_{4(aq)} + H_2O_{(l)}$ ✓1
ii) $Cu^{2+}_{(aq)} + 2e \longrightarrow CU_{(s)}$ ✓1
b) $CuCO_{3(s)} + Cu(OH)_{2(s)} \longrightarrow 2CuO_{(s)} + CO_{2(g)} + H_2O_{(l)}$ ✓1

27. a) $2Br^-_{(aq)} + Cl_{2(g)} \longrightarrow 2Cl^-_{(aq)} + Br_{2(l)}$ ✓1
b) It is more electronegative due to its smaller size ✓1

28. a) white ppt of $Pb(OH)_2$ formed after sometime ✓
ammonia gas produced dissolved forming OH^- ions which react with pb^{2+} ions forming $Pb(OH)_2$ which is a white ppt

b) $NaOH_{(aq)} + NH_4Cl_{(aq)} \longrightarrow NaCl_{(aq)} + H_2O_{(l)} + NH_{3(g)}$ ✓1

29. a) Fractional crystallization ✓1
b) constituent of baking powder✓1
(Any other suitable use)

30. $50cm^3 = 11.5g$
$100cm^3 = \frac{100 \times 11.5}{50}$ ✓1
= 23g/100g of water✓1

CHEMISTRY PAPER 2
233/2
CONFIDENTIAL
MARKING SCHEME

1. a) E – 2:6 ✓ ½
M – 2: 8: 6 ✓ ½
b) (i) E^{2-} or F^- *any one ½ mark*
(ii) H^+ or I^{2+} *any one ½ mark*
c) Amphoteric oxide✓1
d) N✓ ½ because reactivity of non- metals increases down the group✓ ½

e) (i) K has a giant molecular✓½ structure in which there are very strong covalent bonds which ✓ ½ require a lot of energy to break than in N which has a simple✓ ½ molecular structure with weak vaw der waal's force that require
less energy to break
(ii) increases in metallic bond strength from H to J hence ionic radius decreases from H to J

f) (i) H floats on water since it✓1 is less dense than water. Hydrogen✓ ½ gas is produced and heat✓ ½ which melts H

(ii) $2H_{(s)} + 2H_2O_{(l)} \longrightarrow HOH_{(aq)} + H_{2(g)}$ ✓1
$2Na_{(s)} + 2H_2O_{(l)} \longrightarrow 2NaOH_{(aq)} + H_{2(g)}$

2. a) (i) By raising the pressure ✓1
(ii) To melt the sulphur ✓1
(iii) To change molten sulphur into a low density froth and force it up to the surface✓1

b)- Manufacture of sulphuric acid
- Vulcanization of rubber
- Bleaching of wood pulp in paper industry
Any two ½ mark each

c) RFM of SO_2 = 32 + (16 x 2) = 64 ✓ ½
sulphur = 32 x 3 = 96 ✓ ½
75% of 96 = 72g
64g $So_{2(g)}$ ⟶ 72g of s ✓ ½
$\frac{3.6 \times 64}{72}$ g SO_2 ⟶ 3.2g of S
✓ ½
64g ⟶ 24 dm^3
3.2g ⟶ $\frac{3.2 \times 24}{64}$ ✓ ½
= 1.2 dm^3 or 1200cm^3 ✓ ½

d) (i) – zinc sulphide
Iron sulphide
Lead sulphide
Iron copper sulphide.
Any two ½ mark eachAny two ½ mark each
(ii) $Ba^{2+}_{(aq)} + SO_3^{2-}{}_{(aq)} \longrightarrow BaSO_{3(s)}$ ✓1
(iii) blue litmus turns red and red litmus remains red✓ ½ since L is acidic ✓1
(iv) the white precipitate dissolves forming a colourless solution ✓1
$BaSO_3$reacts with hydrochloric acid forming Ba Cl_2✓1 which is soluble.

3. a) Experiment | 1/T

1	0.0185
2	0.01587
3	0.012195
4	0.00971
5	0.00609

b) (i) scale – 1 mark
plotting – 1mk
line best fit – 1mk

(ii)shown on the graph✓ ½ 1/t currently read from graph✓ ½
t = correct found from 1/t ✓ ½ mk

(iii) the rate of the reaction is directly✓1propotional to the concentration of H_2O_2

(iv) –temperature
- catalyst
- pressure
- site of particles use (any *two 1 mark)*

c) The equilibrium shifts from right to left or backward reaction✓ ½ is favoured. The color changes from colourless to yellow - orange✓ ½

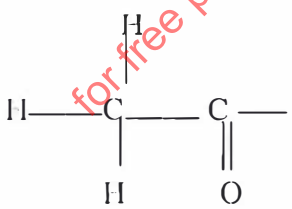
4. a)(i) Condensation polymerization ✓ ½

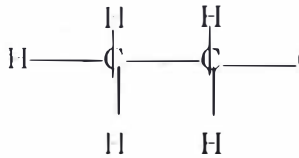
(ii) $\left(OCH_2CH_2 - O - \overset{O}{\overset{\|}{C}} - \overset{O}{\overset{\|}{C}} - \right)_n$ ✓1

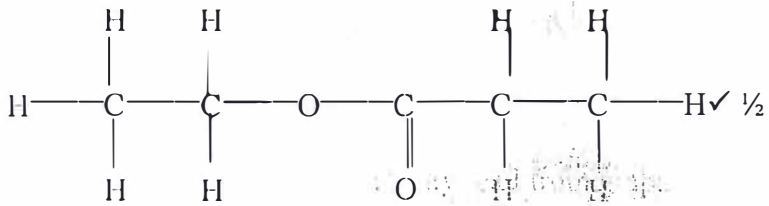
(iii) It is a synthetic fibre✓ ½

b)(i) M – ethylhydrogen sulphate✓ ½
N - Ethanol✓ ½

(iv)

P  ✓ ½ Ethanoic acid

Q  ✓ ½ ethanol

R  ✓ ½ ethylpropanoate

(iii) $2CH_3CH_2OH_{(l)} + 3O_{2(g)} \longrightarrow 2CO_{2(g)} + 3H_2O_{(l)}$ ✓1

(iv) Reagent – hydrogen gas ✓ ½

Conditions – Nickel catalyst

Temperature 150 – 250^{0}C ✓ ½

(v) Add sodium carbonate to both of them separately, P liberates a colourless oduorless✓ ½ gas while N does not react with Na_2CO_3

(vi) $\left(CH_2 - CH_2 -\right)_n = 8400$

$(12 \times 2 + 1 \times 4)\ n = 8400$✓ ½

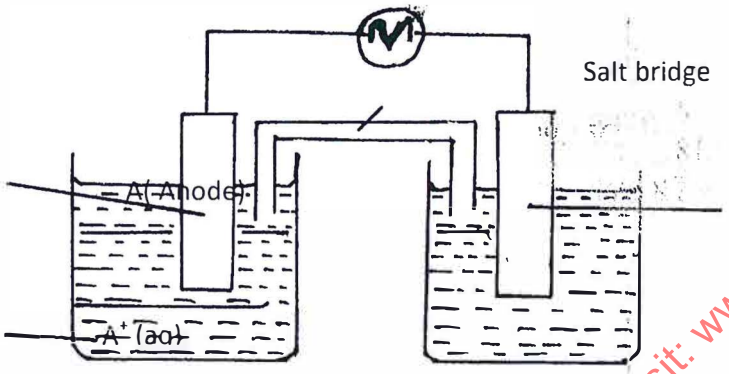
$28n = 8400$

$n = \frac{8400}{28}$

$n = 300$✓ ½

5. a)(i) F✓ ½ it has the highest E^0 value

(ii)



E – cathode)

E^+ (aq)

E^0 cell = 0.799 - -2.37 ✓ ½ = 1.57✓ ½

b)(i) Electrolysis is the decomposition of an electrolyte by passing an electric current✓1

(ii) I. A - Cathode✓1

B - Anode✓1

II A – $2H^+_{(aq)} + 2e^- \longrightarrow H_{2(g)}$ ✓ ½

B→ $4\ OH^-_{(aq)} \longrightarrow H20_{(l)} + O_{2(g)} + 4e^-$ ✓1

c) $24000cm^3$ of gas ⟶ 2 x 96 500C

$447.6cm^3$ of gas = $\frac{447.6 \times 2 \times 96500}{24000}$✓1

= 3599.45C

Q = It

3599.45 = 1 x 15 x 60

$I = \frac{3599.45}{15 \times 60}$ ✓1

= 3.999A✓ ½

6. a) Hess's law states that the energy change in converting reactants A and B, to products C and D, is the same regardless of the route by which the chemical change occurs, provided that the initial

and final conditions are the same✓1

b)(i) $4C_{(s)} + 5H_{2(g)} \longrightarrow C_4H_{10(g)}$

$4O_{2(g)}$ $O_{2(g)}$ ΔH_3 2 mks

$4CO_{2(g)} + 5H_2O_{(l)}$

(ii) $\Delta H_1 - \Delta H_3 = \Delta H_2$

$\Delta H_1 = 4(-393) + 5(-286)$

$= -1375 - 1430$

$= -2802$

$\Delta H_3 = -2877$

$\Delta H_2 = -2802 - {}^{-}2877$✓ ½

$= 75 KJmol^{-1}$ ✓ ½

c) Lattice energy is the enthalpy change that occurs when one mole of a crystal structure is formed from its gaseous

ions ✓1

Hydration energy is the enthalpy change when gaseous ions are hydrated by water✓1

d)(i) A – Heat of solution ✓ ½

B – Lattice energy✓ ½

C – Hydration energy✓ ½

(ii) $\Delta H_A = \Delta H_B + \Delta H_C$✓ ½

(iii) $\Delta H_A = 2489 + {}^{-}2659$ g ✓ ½

$- 170$ kj mol^{-1}✓ ½

e)(i) Heating value is the amount of heat energy produced when a unit mass of fuel is completely burnt in oxygen✓1

(ii) – Environmental friendly

- High calorific value
- Easy transport and storage

any 2 ½ mk each

(iii) It is cheap, readily available, available, environmental friendly, non-poisonous and burns Slowly

Any two ½ mk each

7. a)(i) G is anode✓ ½

(ii) Cryolite and molten aluminium oxide

(iii) $Al_2O_3.2H_2O$✓1

b) The melting point of aluminium is lower than 800^{0+c}✓1

c) (i) $4Al^{3+}_{(l)} + 12e^{-} \longrightarrow 4Al_{(s)}$ ✓1

(ii) at high temperature of the cell, oxygen formed at the anode reacts✓1 with graphite (anode) forming carbon(IV)oxide

d) Na^{+} ions are more ✓ ½ reactive than AL^{3+} hence less readily reduced

F^{-} ion are more ✓ ½ reactive than O^{2-} and therefore less ✓ ½ readily oxidized

This gradually eats away the anode rods hence the need for frequent replacement

e) It contains an unreacted coat of aluminium oxide which is formed as soon as the metal is

exposed to moist air which prevents any reaction.

f) (i) Iron(III)oxide and silica (SiO_2) ✓ ½

(ii) It is harder than pure aluminium. ✓ ½

lighter

harder any one ✓ ½ mark

CHEMISTRY PAPER 3

233/3

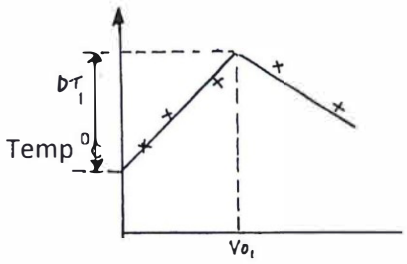
CONFIDENTIAL

MARKING SCHEME

1. Table I – table 1✓1

- Decimal✓1
- Trend – values increase, then reduce (or remain constant)
- Accuracy – Teachers highest values ± 0.5^0C✓ ½

a)



Plotting 6 - 7✓1

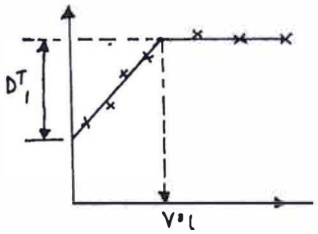
5✓ ½

<5 no mark

shape of the graph✓1

OR

Volume of G added (cm^3)



Rise in temp ΔT_1 from the graph✓ ½

b) Read from the graph✓1

c) Ans (b) ✓ ½ = Ans (c)
1000

d)i) mole ratio 1:1 ✓ ½

moles of F = Ans (c) ✓ ½

d)ii) 1000 x Ans in (di) ✓ ½ = Ans ✓ ½
10

D(iii) 71 . ✓ ½ =RMM✓ ½
Ans dii

HA = RMM

1 + A = RMM✓ ½

A = RMM – 1 = Ans ✓ ½

e)- mass of solution = 10 + Ans(b) ✓ ½

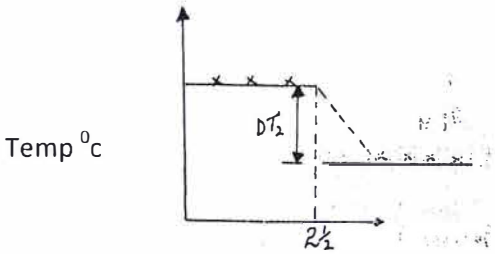
- Substitution in the formula✓ ½

- Correct answer with –ve sign and in KJ/mol✓1

Table II - Table✓1

- Decimal✓1
- trend✓ ½
- Accuracy ½ - teacher lowest value at 3 min ± 0.5^0C

f)

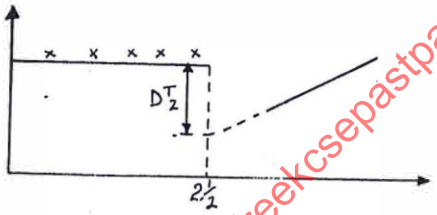


- Plotting 8 - 9✓1

6 - 7✓ ½

<6 no mark

Shape of the graph



Fall in temp T_2 from the graph ½

g) – mass of solution = 10g ½

- Substitution✓ ½
- Positive sign with current units in KJ/mol✓1

h) – Substitution ✓1

- Correct answer with sign and units in KJ/mol✓1

2.

Observation	Inferences
i) white ppt forms ✓½ which is soluble in excess sodium hydroxide✓ ½	Possibly Mg^{2+} or Ca^{2+} ions present ✓ ½ for two ions ✓ ½ for one ion No mark for mixing
ii) a white ppt forms ✓ ½	Ca^{2+} ions confirmed present
iii)dump red litimus paper turns blue ✓ ½ dump blue litimus paper remains blue✓ ½	NH^+_4 ions confirmed present✓1
iv) A white ppt ✓ ½ which dissolve on warming✓ ½	Cl^- ions presenrt
v) A white ppt ✓ ½ which forms✓ ½ which is insoluble in excess dilute nitric acid ✓ ½	Cl^- ions confirmed present✓1
Q3.i) dissolves to form colourless solution✓ ½	Possibly R – OH or R – COOH ions present ✓1 for two ✓ ½ for one No mark for maxing Possibly Mg^{2+} or

ii) PH = 4 - 6✓1	R – COOH present✓1 Or – COOH
iii) Effervescece	R – COOH present✓1 Or - COOH
	R – COOH or – COOH ions confirmed present present✓1
iv) sweet/fruity smelling substance formed✓1	

231/1
PAPER 1
BIOLOGY
MARKING SCHEME

1. a) Antagen A
   Antagen B
   b) Red blood cells have the ability to change their shape. (1mk)
2. - Presence of cell wall
   - Presence of chloroplast
   - Has a large and centrally placed vacuole
   First 3 correct = 3mks
3. - The inner walls have hairs, which trap dust and other small particles that may be inhaled.
   - Have mucus membrane that secret mucus which trap dust particles
   First 3 correct = 3mks
4. - Lack vascular transport system
   - Have Rhizoids for anchorage and absorption of water
   - Are thalloid or differentiated into simple
   Leaf-like and stem – like structure
   - Contain chlorophyll – are photosynthetic
   - Show alteration of generation
5. - Population density
   - Population dispersion
   - Population growth
6. a) X –m Glycolysis
   Y – Aerobics respiration ; oxidation
   b) ATP, Carbon(IV) oxide and water (1mk)
   Ref: If one is missing
7. a) A – Female (1mk)
   B – Male (1mk)
   b) Bilharzia (schistosomiasis) (1mk)
8. a) Osmosis (1mk)
   b) Active transport. (1mk)
9. a) To determine the type of gas produced during photosynthesis (1mk)
   b) Oxygen gas. (1mk)
   c) To provide carbon (IV) oxide which is a raw material for photosynthesis.
10. a) Specific locality with particular set of conditions where an organism lives. (1mk)
    Ecological niche is the exact position occupied by an organism and its role in the habitat.

b) Intraspecific competition – competition among members of the same species
- Interspecific competition – competition among members of different species.

11. a) i) Scapula
ii) Glenoid
iii) Clavicle bone

12. a) A Endothermic (1mk)
B Ectothermic (1mk)

b) - The animals are active all the time
- The animals can colonise any environment

13. i) - Moisture accumulate in the pits preventing water loss from the leaf through the stomata

ii) Hairs trap moist air on the leaf surface which prevents water loss from the leaf into the atmosphere.

14. i) a) Motor neurone
b) X – Nucleus
Y – Node of ranvier

ii) a) Propagates and speeds up transmission of impulse
b) ⟶

15. - Auxin accumulate on the lower side of the shoot and root; due to gravity ; High concentration on the lower side of the shoot promotes faster growth ; on this side ; the upper side with less auxin experience minimal growth; hence the shoot bends upwards.
- High concentration of auxins on the lower side of the root; inhibit growth, the upper side of the root with less auxin ; experience faster growth than the lower side ; causing the root to bends downwards.

16. a) A pooter (1mk)
b) It is used to suck small animals from rock surfaces or barks of trees. (1mk)

17. Make the structures visible / clear . (1mk)

18. - The names were not underline separately
- Genus name started with a small letter
- The species name has started with a capital letter. (3mks)

19. 1mm = 10 000 mm
3mm = 3 x 1000

$\frac{3000}{6000} = \frac{3000\mu m}{0.5\mu m}$

20. Water in the plant move out by osmosis the cell is plasmolysed wilting / leaves drops. (2mks)

21. a) Mitochondria (rej. Mitochondria) (1mk)
b) Chloroplast (rej. Chloroplast) (1mk)

22. a) Synthesis of haemoglobin in R.B.C/ plays a role in respiration.
b) Maintains osmotic balance of body fluid / important in transmission of nerve impulse (1mk)

23. a) Assimilation is the process whereby the end products of digestion as incorporated in the body cells.
b) Are respired to release energy; metabolic water.
- Are converted into fats and deposited : under the skin to offer insulation against Heat loss / around delicate organs to protect them from mechanical domage. (2mks)

24. - Enzyme remain unchanged

- They catalyse reversible reactions (2mks)

25. A – Carbon (IV) oxide fixation
B – Photolysis (2mks)

26. a) Protect the root tip from mechanical damage
b) - Have thin cell wall
- Have dense cytoplasm
- No vacuoles

27. - Mascular valves to control opening and closing of spiracles

28. Lactic acid fermentation is the breakdown of glucose in a limited supply of oxygen in muscle tissues. While alcoholic fermentation is breakdown of glucose in absence of oxygen in plant tissues.

29. - Exchange of gases and nutrients
- Secretion of progesterone
- Removal of nitrogenous wastes

30. - Softens the seed coat
- Activates enzymes
- Hydrolyses and dissolves food
- Medium of enzyme action
- Medium of transport of food to growing regions. (3mks)
(The first one correct)

31. a) Is the crossing of an organism of unknown genotype with a homozygous recessive organism to determine the genotype. (1mk)
b) Is the external appearance of organism as determine by genes / is the expression of a gene. (1mk)

32. X^hY (1mk)

33. **Divergent evolution** structures with similar embryonic origin are modified to perform different functions
Convergent evolution is where structures with different embryonic origin perform similar functions e.g wings of birds and insects.

231/2
Paper 2
BIOLOGY
MARKING SCHEME

1. a) Kidneys rej any other
b) R –Medulla ; rej any other
S – Pelvis ; rej pyramids
Desert rate large medulla.
c) i)

Desert rate	**Fish**
Large medulla	Small medulla surface
Long loop of henles	Short loop of Henles
Small cortex surface	Large cortex surface

ii) Large medulla surface for maximum reabsorption of water ; due to extensive/ long loop of Henles

Small medulla surface smaller ; surface for reabsorption due to short loop of Henles;

2. a) In beer industry / fermentation of alcohol wines
Fermentation of foods in food industries e.g yoghurt, cheese, bread
Power industries alcohol is used as a substitute for petrol and
Biogas production for cooking and lighting and compact manure;
During the first phase

b) Through glycolysis / glucose breakdown pyuric acid is formed ; with two ATP molecules
During the second phase / kreb's cycle
The pyuric acid converted into Acetyl Co A combines; with oxygen(oxidizeo / to produce 36 ATP / Energy, carbon (iv) oxide and water ;

3. a) 1 motor / efferent Neuron ;
2 Relay / intermediate Neuron ;
3 Sensory Neuron:

b) Towards the motor Neuron ; from the sensory

c) Grey matter rej any other ;

d) Impulse reaching the dendrite end of relay / Neurons ; causes the synaptic vessels to release acetylcholine / transmitted chemical ; which defense a cross the cleft and causes the depolangation of the motor Neuron; 3 x 1 = 3

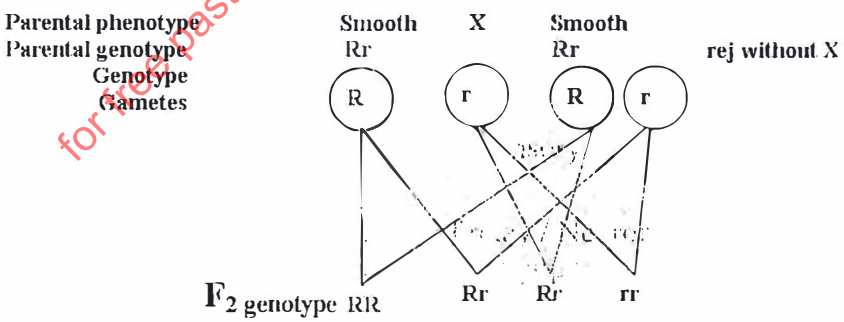
4. a) Smooth seed coat is dominant to wrinkled seed coat;
Parental genotype RR x r✓
Any appropriate letters

RR	R	R
✓	Rr	Rr
✓	R	Rr

;

All F_1 Rr/ Heterozygous;

b)



i) Genotypic 1 Re : 2Rr; 1rr ; x2

ii) Phenotypic ratio 3 smooth : 1 wrinkled ;

iii) Wrinkled number ¼ x 734 = 1831 ;

5. a) i) Chloroplast ; rej any other

ii) Oxygen

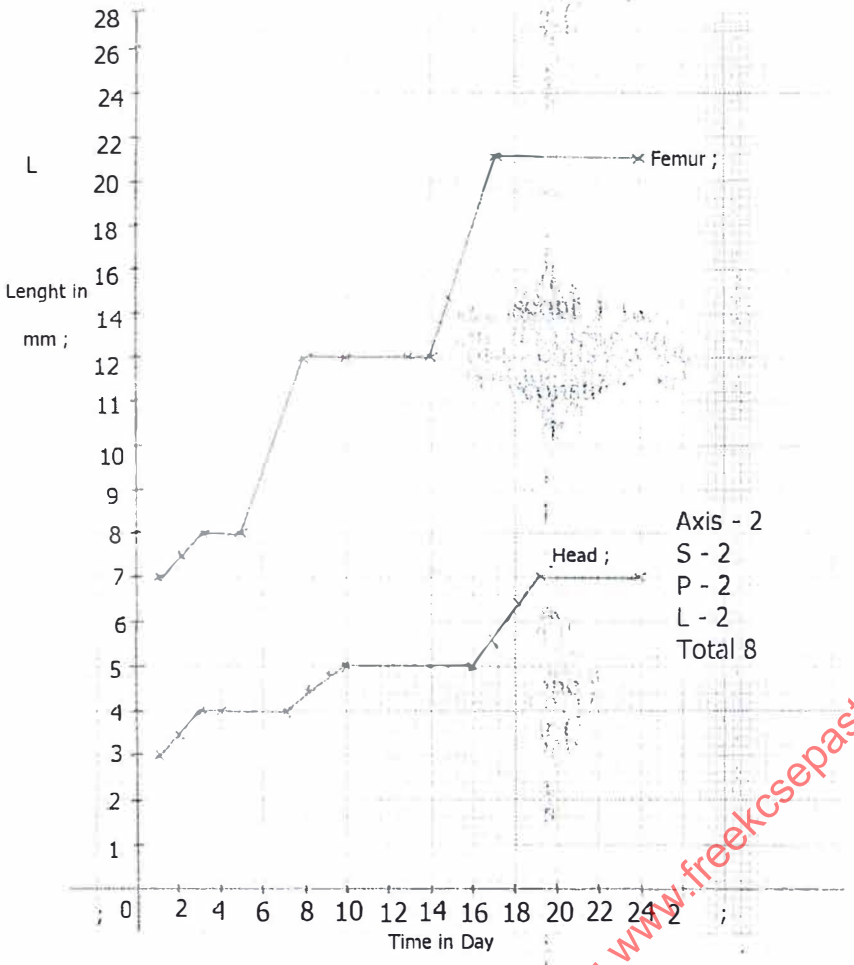
b) i) Provide the energy for photolysis / break down water into hydroxide ions and hydrogen ions required in the dark reaction;

ii) To provide Hydrogen ions ; required on the process a medium of reaction

iii) Provide carbon required to combine with hydrogen and oxygen to form a carbohydrate / glucose ;

c) (respired oxidized) to produce cellular / cell energy / ATP; used in synthesis of cellulose at cell wall converted into starch and stored;

6. a)



(8mks)

b) i) Intermittent growth ; / discontinuous growth;

ii) Phylum arthropoda;

c) i) Length of femur remains constant / No change in length ;
Growth has not taken place because of the presence of rigid exoskeleton lenticle which units expansion of tissues ;

ii) Length of femur increased because moulting / ecodysis / shedding of exoskeleton has occurred allowing growth / expansion of tissues

d) - Juvenile hormones ;
- Moulting / ecdysone hormone ;

7. - Sulphur based chemical e.g sulphur (IV) oxide produced by industries (food preserving) industries affect gaseous exchange / makes acid rain / damage plant leaves (blonine oxides of nitrogen, hydrogen sulphide from sewage / decomposing organic matter / mines / or any gaseous pollutant.
- Aerosols, sprayed to control plant diseases / parts also affects respiratory organ of animals. The chemicals are resided and persistant / depletion of ozono layer by CFC – pesticides, herbicides, insecticides, paint sprays, agro- chemicals acaricides etc.
- Smoke / fumes ; produced in areas with (heavy) industries / fire/ (high density) of motor vehicles ; which burn fuels / oils / coils / wood ; This cause carbon (IV) Oxide prisoning ; Affect respiratory system / visibility ;

- Fumes also settle on leaves and stop photosynthesis ; excessive production of carbon (IV) oxide causes green house effect / temperature inversion as a result of heating in lower rears of the atmosphere ;
- Sound / noise ; produced increasingly / continuously by machines / earoplans/ trains ; affect hearing in animals
- Dust produced in industries producing cement generate dust which finally settles on plant leaves timidity photosynthesis.
- Cutting / removal of vegetation; interferes with carbon cycle
- Radioactive emission from in vines / bomb / nuclear reactor and those produce energy may cause cancer Infatution or death.

8. a) Enzyme are bio – catalysts which are protein in nature;

b) Protein in nature

Affected by temperature and pH;

- Substrate specific act in certain specific food substances can be used again and again hence required in small amounts.
- Are catalystace speed up rate of chemical reactions but are not used up in the reaction most enzyme controlled reactions are reversible i.e they catalyse both forward and backward reactions.

c) i) **Temperature** . Enzyme work but within a certain temperature range. Increase in temperature within this range results to increased rate of reaction,

- A reduction of temperature within this range leads to reduced rate of reaction. It too high temperatures, they become inactive substrate concentration the higher the concentration of substrate, the faster the rate of reaction, however the rate becomes constant when all hence at a certain concentration of substrate, reaction rate remains constant.
- **Enzyme concentration**- The higher the concentration of enzymes the faster the rate of reaction.
- However when substrate concentration become limiting / few the rate remains constant. The active sites of excess enzymes remains empty hence NO corresponding increase in reaction rate.
- Presence in inhabitation – competition inhibitors compete with the substrate for the enzyme's active site hence reducing rate of reaction .
- Non- competitive inhibitors bind on the enzyme changing the shape of the active site. The enzyme cannot bind the substrate hence reducing reaction rate.
- **PH**- Enzymes work best at optimum pH above or below this pH, enzyme activity drops hence reduced rate of reactions i.e become denatured.
- **Produce concentration** – If the products of enzymes catalysed reaction are left to accumulate the rate of reaction slow down. In this situation reverse reaction is favoured.

231/3
Paper 3
BIOLOGY
MARKING SCHEME

1. a) J – No reaction
K- Fast Reaction in fizzing and firstling
L – Slow reaction in fizzling and frusting
M – Fast reaction in Fizzling and frosting

b) i) Reaction is fast in k while in J, there is no reaction

ii) Equal reaction

c) i) There was no reaction in test tube J because boiling destroyed / denatured enzyme catalase while in v, the reaction was fast because grinding increased the surface area for enzyme action

ii) Reaction rate was equal / same because both cubes were ground increasing surface area for enzyme action.

d) Hydrogen peroxide ⟶ water + oxygen

2. a) J lungs
K Gill

b) They both act as a site for gaseous exchange

c) X trachea
Y lung
Z heart

d) i) 1 Gill rakers
2 Gill bar
3 Gill filament or lamellae (3mks)

ii) 1 Has spear like projections for filtering solid impurities
3 Are highly folded to increase surface area for oxygen to diffuse

a) Bean seed
Two scars

b) Plantae
Angiospermae
Dicotyledonae
Two cotyledons / seeds leaves

3. a) i) J - Atlas vertebra
K - Axis vertebra
L - Thoracic verbra

ii) J - articulates with, and supports the skull
- Allows nodding movements of the head

K - Articulates with the atlas
- Re-enforces the support for the skull
- Allow for the side rotation of the head

L - For articulation with ribs.
- For attachment of the intercostals muscles

b) i) - Long neural spine which offers a large surface area for the attachment of back muscles.

- Large centrum for articulation with other thoracic vertebra
- Has facets on each transverse process to articulate with ribs

ii) Spinal cord

c)
- Long and well developed neural spine
- Well developed centrum
- Absence of vertebraterial canal
- Facets for the articulation of the ribs

232/1
PHYSICS
PAPER I
MARKING SCHEME

SECTION A(25MKS)

1. It state that matter is made up of particles that are in constant motion due to increase of temperature i.ethey posess kinetic energy due to change in temperature.
2. Mass of aluminium =65g-15g=50g.
   Mass of water=95g-65g=30g
   Volume of water=M/D =30g/19cm3=30cm^3.
   Density of Aluminium turnings
   =50cm^3-30cm^3=20cm^3.
   Volume of Aluminium $=\frac{\text{mass}}{\text{Volume}} = \frac{50g}{20cm^3}$
   $=2.5g/cm^3$
3. Increase in area of contact of the tyre with the road which reduces pressure exerted hence minimises the destruction of roads and also makes the truck to get stuck.
4. (i) lower the temperature
   (ii) Remove impurities
5. When there is fire brass expands faster than iron thus bending downwards completing the circuit. This makes the bell to ring raising the alarm.
6.
7. 20N ×10cm=(40cm×2N)+(40cm×H)
   200=80+40H
   40H=200-80
   $\frac{40H}{40} = \frac{120}{40}$
   H=3N (attractive force)
8. Extension of a spring is directly proportional to the force applied provided elastic limit is not exceeded.
9. As the candle burns its mass is lost thus it becomes lighter and lighter therefore it rises.
10. It states that when the pressure is high the velocite of the fluid is low and vice versa.
11. f=50Hz, $T=\frac{1}{f}=\frac{1}{50}=0.025$

    $U=\frac{0.5cm}{0.025}=25cm/s$ $V=\frac{2.5cm}{0.025}=175cm/s$

$$A=\frac{v-u}{t}=\frac{175-25}{5\times 0.02}=\frac{150cm/s}{0.1}$$

$=1500cm/s^2$

12. V1=4l

T1=27+273=300k

P1=P

$$\frac{P_1V_1}{T_1}=\frac{P_2V_2}{T_2}$$

$P_1V_1=P_2V_2$

$$\frac{P\times 4}{2P}=\frac{2P}{2P}\times V^2$$

V_2=2Litres

$$\frac{V_1}{T_1}=\frac{V_2}{T_2}$$

$$\frac{2L}{300K}=\frac{1}{T_2}$$

$$\frac{2T_2}{2}=\frac{300}{2}$$

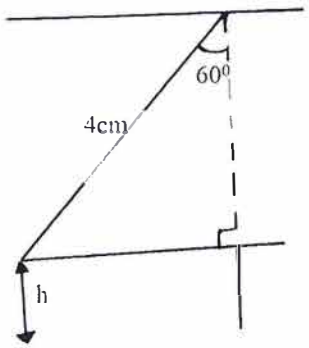
T_2=150K

SECTION B(55MKS)

13. (a) Inertia is tendency of a body to resist change of motion.

(b) (i) in elastic collision both momentum and it is conserved.

(iii)



Cos 60^0=l/4

L=4 cos 60^0=2m

h=4-2=2m

½ mv^2=mgh

V^2=2gh

$V=\sqrt{2\times 10\times 2}$

$=\sqrt{40}$

=6.3246m/s

$m_1u_1+m_2u_2=m_1v_1+m_2v_2$

$(4\times 6.324)+0=0+1+V_2$

v_2=25.2984m/s

Distance =V2t

=25.2984×0.6325

=16m

(ii) $s=ut+\frac{1}{2}ut^2$

$$\frac{2}{5} = \frac{\frac{1}{2}(10)t^2}{5}$$

$$t^2 = \frac{2}{5}$$

$$t = \sqrt{0.4}$$

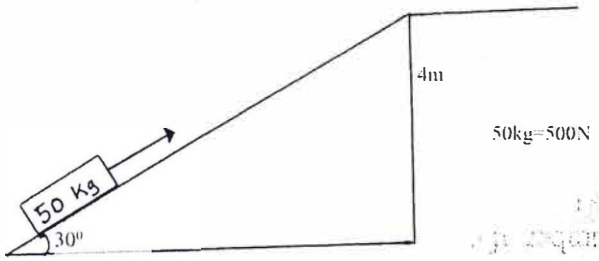
$$= 0.6325\ s$$

(e) This will reduce the impulsive force by increase the time of contact or impact into ground.

14. (a) 1. Energy is wasted in overcoming friction between the moving parts of the machine.
2. Energy is wasted in carrying some parts of the machine.

(b)

(i)



$$V.R = \frac{1}{\sin Q} = \frac{1}{\sin 30^0} = 2$$

$$\text{Efficience} = \frac{M.A}{V.R} \qquad \text{Effort} = \frac{L}{M.A} = \frac{500N}{1.6}$$

M.A=0.8×2

=1.6 =312.5N

(ii) output =work done

=4m×500N

=2000J _____ 80%

=? _____ 20%

$$\frac{20}{80} \times 2000J$$

=500J(friction)

15. (i)MCθ =H,mLf= θ 200g=0.2kg

400g=0.4kg

40g=0.04kg

$M_WC_W\theta + M_iL_f = M_CC_C\theta + M_WC_W\theta$

$0.2(3.36\times10^5)+(0.2\times4200)(x^0)=0.4\times4200(40-x)+0.04(400)(40-x)$

$0.672\times10^5+840x=1680(40-x)+16(40-x)$

Heat gained by ice $=6.72\times10^4+840x$J.

(ii) Heat lost by calorimeter

=1680(40-x)+16(40-x)

=67200-1680x+640-16x

=67840-1696x

(iii) 67,200+840x=67840-1696x

840x+1696x=67840-62200

$\frac{2536x}{2536}=\frac{640}{2536}$ x=0.2524^{0}c

(c) Ether evaporates by getting the latent heat of vaporisation from water thus the water temperature will be lowered.

16. (a) There is acceleration due to change of direction as it rotates and because velocite is a useful quantity thus it changes hence acceleration.

(b) Skidding will occur because the road should be saucer like shape so as to provide enough centripedal force.

(c) (i)-Centripetal force towards the centre.

-Tensinal force in the spring.

(ii) W=Vr

V=r/w

$W=\frac{2\pi}{T}=\frac{2\times 3.142}{5.2367}$

=1.2

$V=\frac{0.2}{1.2}$ =0.1667m/s

$2\pi r=2\times 3.142\times 0.2$

=1.2568

0.12-0.5

$T=\frac{1.2568}{0.12}\times 0.5=5.23675$

$F=\frac{mv^2}{r}=\frac{0.04\times(0.1667)^2}{0.2}$

=0.0055577N

17. (a) (i)Relative densite = $\frac{\text{weight in water}}{\text{Weight in air}}$

$=\frac{0.22N}{3N}$ =0.0733

(ii)800kg/m^3=RD=0.8

0.8 = $\frac{\text{weight in liquid}}{\text{Weight in air}}$

Weight in liquid =0.8×3N=2.4N

(b) (3N×20cm)-(upthrust ×20cm)=(30cm×2N)

100-20U=60N

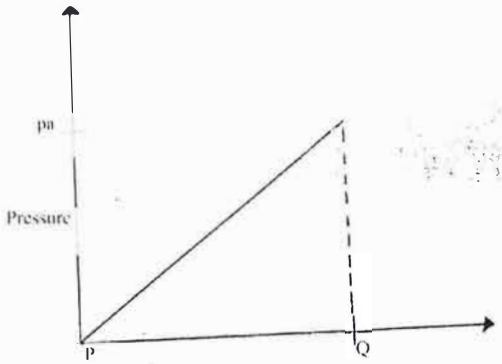
$\frac{40}{20}=\frac{20U}{20}$

Upthrust =2N

(c) p=hdg

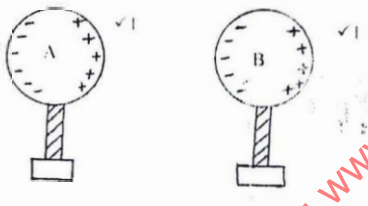
=100cm×1000kg/m^3×10Nkg

=10,000pa.



232/2
PHYSICS
PAPER 2
MARKING SCHEME

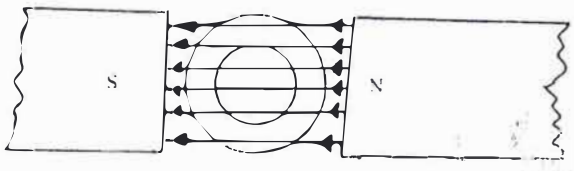
1.



2.

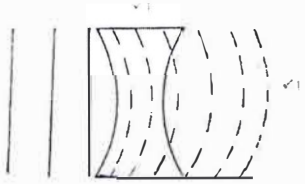
3. P is the emf of the cell✓1
Emf is this pd across a voltage source when it is not producing current

4.



✓1 straightenes
✓1passing through the plastic

5.



6. Observer A, hears continuous loud sound with decreasing intensity. This is due to constructive✓1 interfere and the distance from source.
   Oberver B. hears alternatining loud and soft sounds with the loudest being between the loudspeaker this is because of constructive and destructive interference.
7. x-live wire✓1
   p-Ring mains✓1
   switch s is on the neutral wire
8. The device heats at a rate of 1.5kw when it is connected to a 240v supply.✓1
   Energy =pt ✓1
   =1500×5×60×30✓1
   =13500000J1 or (13.5MJ)✓1
9. When the distance in increase, the intensity is reduced,
   Reduction in intensity imply reduction in number of electron emited.
10. When the filament current is increased more heat✓1 is produced, which results in more photoelectrons; This in turn increases the intensity of the x-rays.✓1
11. $\frac{3}{2}$ cycles occupy 4 div

    1 cycle occupies $\frac{1}{\frac{3}{2}\times 4}$

    $=\frac{2}{3}\times 4$

    $=\frac{8}{3}$ div

    The time for the cycle $=\frac{8}{3}\times 100ms$ ✓1

    $T=\frac{800}{3}$ ms

    But frequency $=\frac{1}{period}=\frac{3}{800ms}=\frac{3}{800\times 10^{-3}s}$

    $=\frac{3000}{800}$✓1

    =2.75Hz
12. (a) capacitance c is the charge stored in a capacitor per unit voltage
    (i) the deflection of the leaf decreases since the pd reduces with the distance of separation, the greater the deflection, the smaller the capacitance.
    (ii) the deflection of the decreases since the pd increases with the area of overlaps or the greater the deflection the smaller the capacitance.
    (iii) the deflection of the leaf decreases, the capacitance increases ,since the smaller the deflection the greater the capacitance.

    $C_T=C_1+\frac{C_2C_3}{C_2+C_3}$ ✓1

    $=3\ \mu F+\frac{4\times 4}{4+4}$✓1

    =3 μ F+2 μ F✓1

$=5\ \mu f$ ✓1

Charge on the 3 μ F capacitor is the same as the overall charge Q =CV ✓1

$=5.0\times10$ ✓1

$=50C$ ✓1

13. (a) The direction of the induced emf is such that induced current which it ceases to flow produces a magnetic effect that occupy the change producing it.

(b) (i)The vibrating diaphram moves the coil cross the magnetic ffus, a varrying induced current is therefore produced.

(ii)Increase the number of turns

Increase the straight of the magnet.

(c) $\frac{NP}{NS}=\frac{VP}{VS}$ ✓1

$\frac{1200}{120}=\frac{400}{V_S}$ $V_S=\frac{120}{1200}\times 400$ ✓1

$=40V$ ✓1

(ii) $\frac{p_o}{p_1}=1$ *or* $p_p=p_s$

$V_pI_p=V_SI_S$ ✓1

$400\times I_p=600$ ✓1

$I_p=\frac{600}{400}$ ✓1

$=1.5A$ ✓1

14. (a) Refractive index of a substance in the ratio of the velocity of light in the first medium to its velocity in the second medium.

Refractive index is the ratio of the $\sin\theta$ of his angle of incidence to $\sin\theta$ of the angle of refraction for a given pair of media.

(b) Refractive index $=\frac{Real\ depth}{Apparent\ Depth}$

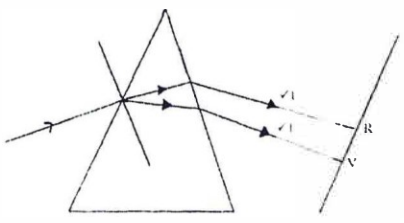
$=\frac{1}{slope}$ ✓1

$=\frac{1}{\frac{10-0}{15-0}}$ ✓1

$=\frac{15-0}{10-0}$ ✓1

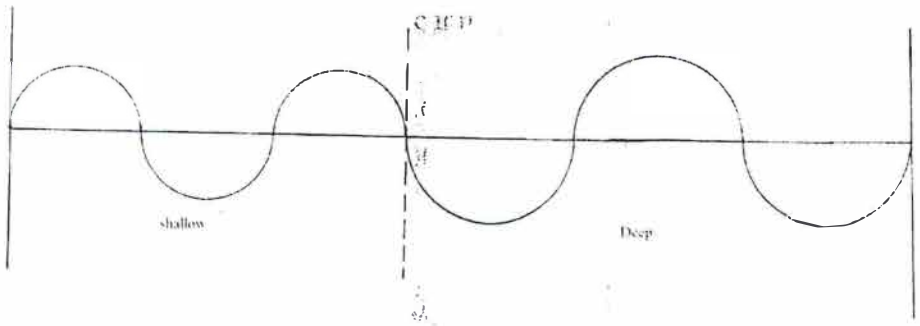
$=1.5$

(c) (i)



(ii) Just above red, because it is where the infra red occupies in the spectrum.

(d) (i)



(ii) the velocity of the wave increases ,and since the ✓1 frequency remains constant, the wavelength must increase

(iii) the frequency in constant✓1

15. (i) A-cathode

B-anode

(ii) When the pd is increase, the current increases and this results in more heating. The number of electrons produce increases, hence the intensity increases.

(iii) the fast moving electrons are suddenly ✓1 stopped. Their kinetic energy is converted to heat✓1

(iv) Lead has very high density, hence cannot be penetrated by the x-rays

(b) By depth ev=hf

$1.6\times10^{-19}\times12000=6.62\times10^{-34}\times f$✓1

$f=\frac{1.6\times10^{-19}\times12000}{6.62\times10^{-34}}$✓1

$=2.9\times10^{18}$Hz✓1

16. (a) (i)Threshold frequency is the minimum frequency of radiation below which no emission will occur.

(ii)Work function is the minimum energy to dislodge an electron from a metal surface.✓1

(b) by defin

KE $=h(f-fo)$

$=6.63\times10^{-34}\times3.0\times10^{15}-6.4\times10^{-19}$✓1

$=1.989\times10^{-18}-6.4\times10^{-19}$✓1

$=1.989\times10^{-18}-0.64\times10^{-18}$

$=1.349\times10^{-18}$j✓1

(c) (i)By detin

$M=(\frac{1}{2})^n\times Mg$

$50=\frac{1}{2^4}\times Mg$✓1

$\therefore Mg=50\times16$

$=800$g✓1

(ii) r-4✓1

s-2✓1

Energy –Electromagnetic waves.(plotons)

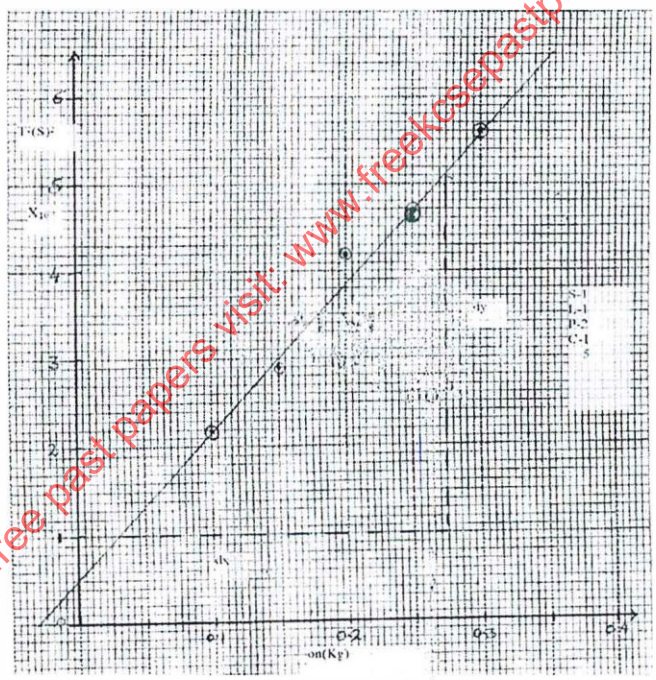
232/3
PHYSICS
PAPER 3
MARKING SCHEME

QUESTION 1

(i) b=0.025m (1mk)
h=0.0076m (1mk)

(ii)

Mass m(kg)	Time t for 10 oscillation(s)	Periodic table t(s)	$T^2(S^2)$
0.1	4.74	0.474	0.24
0.15	5.42	0.542	0.294
0.20	6.50	0.650	0.422
0.25	6.88	0.688	0.474
0.30	7.47	0.747	0.557
	(4mks)	(1mk)	(1mk)



(iii) $S = \frac{dy(5.2-1.0)\times10^{-1}}{dx 0.275-0.03}$ ✓1 $= \frac{0.42}{0.245} = 1.7143$

S=1.7143✓2

(iv) $S = \frac{16\pi^2 l^3}{bh^3 k}$ ✓1

$K = \frac{16\pi^2 l^3}{bh^3 s}$ ✓

$= \frac{16\times(3.142)^2\times0.95^3}{0.025\times0.0076^3\times1.7143}$ ✓2

$=7.197\times10^9 N/m^2$ ✓1

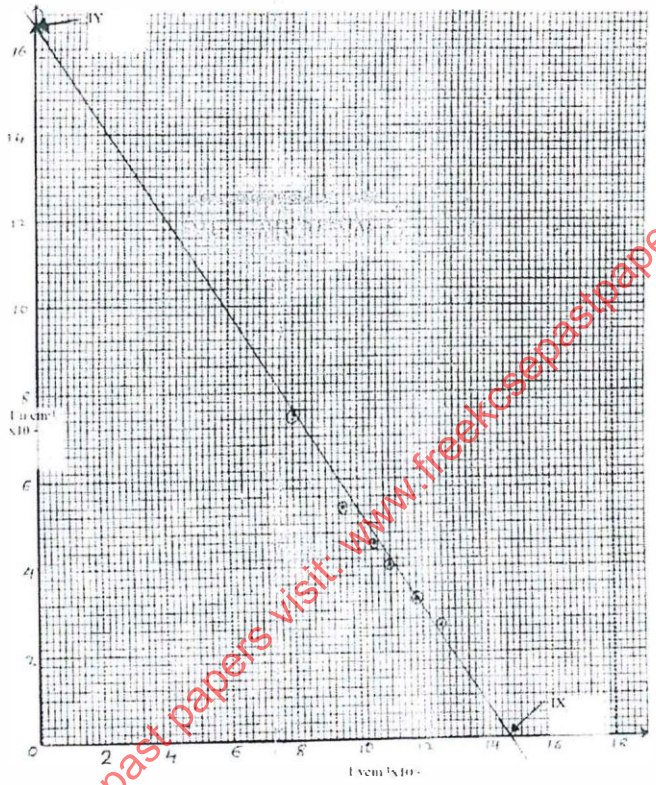
QUESTION 2

(i) C=21.5cm✓1m

(ii) $D=\frac{21.5}{\pi}=6.85cm$✓1m

(iii)

Object distance u(cm)	15.0	20.0	25.0	30.0	35.0	40.0
Image distance v(cm)	12.5	10.5	9.5	9.0	8.5	8.0
$\frac{1}{u}cm^{-1}\text{x}10^{-2}$	6.7	5.0	4.0	3.3	2.9	2.5
$\frac{1}{v}cm^{-1}\text{x}10^{-2}$	8.0	9.5	10.5	11.1	11.8	12.5



(iv) Y –intercept Iy=16.7✓1m
X-intercept Ix=14.7✓1m

(v) $A=\frac{Iy+Ix}{2}=\left(\frac{16.7+14.7}{2}\right)\times10^{-2}=0.157$ 1m✓

(vi) $K=\frac{4}{4-AD}=\frac{4}{4-\frac{0.157}{cm}\times6.84cm}=1.367$✓3M

HISTORY AND GOVERNMENT
(311/1)
Paper 1
July/August 2018
MARKING SCHEME

SECTION A

1. Electronic sources of information on History and government. (2mks)
i) Radio
ii) Television
iii) Microfilm/microfiches
iv) Audio visual sources.
v) Databank and data bases/internet.
(2 x 1 = 2mks)

2. Community in Kenya that belongs to the River Lake Nilotes.(1mk)
- The Luo
(1 x 1 = 1mk)

3. Economic benefits of the Oman rule along the Kenyan Coast during the 19th C. (2mks)
i) Oman established long distance trade in East Africa that added value to the East Africa resources e.g ivory, Rhino horns.
ii) Led to the development of plantation agriculture along the Kenyan Coast.
iii) They introduced new crops in East African Coast e.g Malyues, rice, sugarcane.
iv) They introduced money economy in Kenya.
v) New lines of transport were opened between the coast and the interior e.g trade routes.
vi) They linked E. African Coast to international trade/it linked E.Africa to the global commercial network.
(2 x 1 = 2mks)

4. One town that developed as a result of the long distant trade on the coast of East Africa.
- Mombasa - Pemba
- Lamu - Zanzibar
- Kilwa
(1 x 1 = 1mk)

5. Two ways in which Kenyan citizenship can be acquired (2mks)
i) Through registration.
ii) Through Birth.
(2 x 1 = 2mks)

6. Two ways in which the Kenyan constitution promotes national unity. (2mks)
i) Guarantees equal opportunity to all Kenyans.
ii) Provides protection to individuals against any forth of discrimination Bill of rights.
iii) Provide for unitary government.
iv) Election of President by all Kenyans.
(2 x 1 = 2mks)

7. One type of democracy.
i) Pure or direct democracy.
ii) Indirect democracy.
iii) Constitutional democracy.
(1 x 1 = 1mk)

8. Two changes promulgated in the Kenyan New constitution on 28 August 2010.
- Reduction of Presidents executive powers.
- Devolution of power to regions (creation of county and National government).
- Creation of the Senate and National Assembly to constitute the parliament.
- On citizenship, birth and registration on the only recognised ways of attaining Kenyan citizenship, and duel citizenships is now recognised by the Kenyan constitution.
- Recognition of Kadhi's courts as subordinate courts in the judicial courts system.
- Expansion of the citizens Bill of Rights to guarantee equal representation for either gender in all government structure.
(Any 2 x 1 = 2mks)

9. Two special rights enjoyed by people with disability in Kenya. (2mks)
i) The right to access the public places.
ii) The right to access education.
iii) The right to be treated with dignity and

respect.
iv) The right to equal opportunities.
(2 x 1 = 2mks)

10. One Kenyan community that showed mixed reaction to the British. (1mk)

i) Akamba.
ii) Agikuyu.
iii) Luo
(1 x 1 = 1mk)

11. Two objectives of education offered by the missionaries in Kenya during the colonial period. (2mks)

i) To teach Africans basic literacy and numeracy skills.
ii) To teach Africans better farming methods.
iii) To train African catechists.
iv) To teach Africans basic technical skills.
v) Civilize, better methods of hygiene.
(2 x 1 = 2mks)

12. One negative consequence of urbanization in Kenya during the colonial period. (1mk)

i) Unemployment led to poverty.
ii) Low morality e.g prostitution.
iii) Increase in crime.
iv) Development of shanties/slims.
v) Congestion leading to epidemics.
vi) Break up of family set up.
vii) Development of Kipande System.
viii) Deprived rural areas of manpower/ negligence of agriculture.
(1 x 1 = 1mk)

13. One achievement of Wangari Maathai. (1mk)

i) She campaigned for equal benefits for the women at the University and also as a member of National Council of Women of Kenya. (NCWK).
ii) She was the first African women, and the first environmentalist, to win the Nobel Peace Prize.
iii) She has been very instrumental in environmental protection through the Green Belt Movement.
iv) She succeeded in stopping the government from encroaching on a public utility at Uhuru Park to construct the 60-story Kenya Times Media Trust Complex.
(1 x 1 = 1mk)

14. The main function of the correctional service department in Kenya. (1mk)

i) Rehabilitation of offenders/criminals/ performing the behaviour of offenders.

15. Two pillars of Nyayoish. (2mks)

i) Peace.
ii) Love.
iii) Unity.
(2 x 1 = 2mks)

16. One reason why National Constituency Development Fund was introduced by the government. (1mk)

i) To speed up development at constituency.
ii) To uplift people's living standard in their constituency.
(1 x 1 = 1mk)

17. One role played by theatre in Kenya.

i) It educates people on different aspects of life.
ii) It provides entertainment.
iii) It reflects on the country's political development and good governance.
iv) It helps unite Kenyans as people congregate to watch theatrical performance.
(1 x 1 = 1mk)

SECTION B (45 MARKS)

18a) Five reasons for Cushites migration.

i) Escape from clan or family funds.
ii) There was population pressure in their area of origin.
iii) They were in search of better grazing lands.
iv) They were fleeing outbreak of diseases that affected both people and animals.
v) They were escaping famine and drought.
vi) They fled constant attacks from their neighbours.
vii) They migrated due to spirit of adventure.
(Any 5 x 1 = 5mks)

b) Five results of Cushites migration into Kenya.

i) They inter-married with the people they came into contact with.
ii) Their settlement led to expansion of trade.
iii) There was increased inter-community conflict over resources such as land and water.

iv) Displacement and redistribution of people in the area where they settled.
v) Assimilation of some communities they came into contact with e.g Oromo Vs Somali.
vi) There was cultural exchange with the neighbouring communities e.g some adopted Islam.
vii) There was population increase in the areas where they settled.
(Any 5 x 2 = 10mks)

19a) Factors that promoted development of Indian Ocean Trade.

i) Availability of items of trade.
ii) High demand for trade items/commodities.
iii) Existence of enterprising merchants in both foreign lands and along the East African Coast.
iv) Existence of local trade which acted as a base for the development of the trade.
v) Accessibility of the East African Coast by sea.
vi) Existence of the moonson winds facilitated the movements of vessels.
vii) Existence of natural harbours along the coast ensured safe docking of trade vessels.
viii) Existence of Indian Banyans/money lenders who gave credit facilities.
(Any 5 x 1 = 5mks)

b) Explain six positive effects of missionary activities in East Africa 12 marks.

- Spread of Christianity resulted in abandoning of harmful practices.
- Spread of Western/formal education which led to literacy of the Africans.
- Created job opportunities among the educated Africans in mission schools or as junior clerks in government.
- The elite later played a very important role in the growth of nationalism and in the struggle for independence.
- Provide western medicine. They built hospitals and dispensaries where people were treated for dangerous diseases.
- Improvement of agriculture. The Roman Catholics developed modern methods of farming and introduced coffee growing near Nairobi.
- Trained Africans in industrial skills such as carpentry and masonry.
- Missionaries campaigned against slave trade and established rehabilitation centres such as Frere town near Mombasa.
- Some missionaries like Kraft and Rebmann contributed to exploration of East Africa while Jacob Erhardt drew a crude map of East Africa.
- Politically, a missionary called Dr. John Arthur was appointed by the governor to represent African interests in the Legislative Council in 1923.
(6 x 2 = 12mks)

20a) Why the Wanga collaborated with the British. (3mks)

i) Nabongo Mumia collaborated so as to be made the paramount chief of the entire Western Kenya.
ii) He wanted to secure the British protection against his traditional enemies e.g the Luo, Bukusu & Nandi.
iii) Nabongo Mumia sought help from the British to achieve his territorial expansionists goals.
iv) He wanted to get modern firearms from the British like they had done with Arab & Swahili traders.
v) He wanted to take advantage of the British civilization, particularly education and religion.
vi) He knew the British would declare Western Kenya their sphere of influence like they had done to Buganda.
(Any 3 x 1 = 3 mks)

b) Effects of the Maasai collaboration (12marks)

i) Lenana was recognized as the paramount chief of the Maasai 1901.
ii) The Purko maasai were divided into two, Loita and Ngong. This led to separation of related clans.
iii) Massive tracts of land were alienated and Ngong reserves created for the Maasai.
iv) The Maasai's freedom to conduct their rituals

were curtailed. Only a small portion were left where they could conduct their ceremonies.
v) The Maasai's economy was disrupted. They were forced to reduce the number of livestock and their nomadic lifestyle was curtailed.
vi) The Maasai got material rewards in form of cattle & grains looted from their hostile neighbours e.g Nandi, Agikuyu & Luo of Ugenya.
vii) They lost their independence and their land was declared British protectorate.
viii) Maasai warriors were hired as merceherits against resisting communities such as the Nandi and Agikuyu.

(Any 6 x 2 = 12mks)

21a) 3 reforms of lyttelton constitution.

i) Creation of a multi-racial council of ministers to replace the executive council.
ii) Lifting the ban on African political associations.
iii) It proposed multi-racial elections.
iv) Proposed direct representation of Africans in the Legco.
(Any 3 x 1 = 3mks)

b) Six reason for the emergence of independent schools and Churches.

i) The desire by Africans to retain their cultural values.
ii) Africans were unhappy with the type/quality of education in mission schools.
iii) Independent schools emerged as a reaction against colonial domination and exploitation in terms of taxation, Kipande, forced labour and racial discrimination.
iv) Africans desired leadership in their own Churches.
v) Some Africans felt dissatisfied with the interpretation of the scriptures.
vi) Some Churches were formed to allow Africans to express their Christianity freely through dancing, singing and drum beating.
vii) Some independent Churches were started by people who claimed to have received divine calls e.g John Owalo and Elijah Masinde.
(Any 6 well explained x 2 = 12mks)

SECTION C (30 MARKS)

Answer any two questions

22. State three circumstances that can make a Kenyan citizen to be denied the right to life. (3 marks)

i) When defending one self/property.
ii) When effecting a lawful arrest.
iii) When preventing escape of a lawfully detained person.
iv) When preventing a person from committing a crime/felony.
v) In a situation of war.
vi) When suppressing a riot/rebellion/mutiny.
(Any 3 x 1 = 3mks)

b) Explain six civic responsibilities of a Kenyan citizen.

i) A responsible citizen pays tax to enable the government meet its financial obligation.
ii) To participate in community development activities to improve the welfare of people in the community.
iii) To participate in the democratic process by electing leaders/being elected to ensure good governance.
iv) To obey laws so as to enhance peace in the society.
v) Takes care of the environment in order to promote healthy living.
vi) Prevents/fights corruption to promote proper utilization of resources by all.
vii) Promotes/protects the rights and freedom of all people in society for harmonious coexistence.
viii) Promotes the rule of law by reporting wrong doers/law breakers to the police.
ix) Participate in National debates.
(Any 6 well explained x 2 = 12 mks)

23a) Give three reasons why general elections are important in Kenya. (3mks)

i) They provided Kenyans with an opportunity political leaders.
ii) They enable Kenyans to exercise their democratic rights.
iii) They offer alternative ideas of running the government through different political parties manifestos/ removal of leaders who have

failed.
iv) It is a constitutional requirement.
v) They make elected leaders/prospective leaders work hard to ensure that they are reelected/ elected.
(Any 3 x 1 = 3 marks)

b) Explain six functions of the IEBC in Kenya. (12marks)

i) To maintain and revise the voters' register to ensure it is upto date.
ii) To prepare, distribute and ensure safety of election materials/polling stations.
iii) To conduct voter education in the country in order to prepare citizens for the voting exercise.
iv) To conduct and supervise elections so as to ensure they are free and fair/appoint and train election officials.
v) To conduct language proficiency tests for candidates interested in vying for different posts before nomination in carried out.
vi) To announce and provide a time-table to be followed during the election period.
vii) To receive nomination papers from the candidates cleared to vie by their political parties.
viii) To announce the results and declare the winners for the respective seats.
ix) Divides, name and review of electoral areas/ boundaries.
(Any 6 well explained x 2 = 12mks)

24a) Why does the government of Kenya prepare an annual budget. (5mks)

i) To enable the government to prioritize its needs.
ii) Help the government to identify sources to revenue.
iii) Enables the parliament to approve government expenditure.
iv) Enables parliament to approve government expenditure.
v) Enable the government to estimate the financial requirements for its needs.
vi) Acts as reference for future in correcting.
vii) Smooth running of the government to identify its departments and allocate duties appropriately thus enhancing accountability.
viii) Give useful information to those organizations and individuals who may want to keep track of the government expenditure.
ix) Enables the government to account for funds borrowed/donated for development.
x) Accomplish already started projects.
(Any 5 x 1 = 5mks)

b) What measures does the Kenya government take to ensure the public funds are properly used. (10mks)

i) The government ensures that all intended expenditure is approved by parliament before any expenditure by government.
ii) All reports on expenditure by government ministers are presented to the public accounts committee to the public.
iii) The controller and auditor - general audit ministries and reports to parliament.
iv) The PS in every ministry in charged with the responsibility of ensuring that government funds are well spent.
v) The auditor - general of state corporations audits the expenditure of all government corporations.
vi) Government contracts area advertised publicly for tendering and awards are made on merit.
vii) Establishment of Kenya Anti Corruption authority. (KACA)
(Any 5 x 2 = 10mks)

HISTORY AND GOVERNMENT (311/2)
Paper 2
July/August 2018
MARKING SCHEME

SECTION A

1. Two limitations of using written records.
i) They are expensive to obtain/procure.
ii) May contain biases/exaggerations.
iii) These sources are limited to literate members of the society.
iv) Information may be misinterpreted/ misunderstood by readers.
v) There may be factual errors/omissions/ contradictions by author.
(Any 2 x 1 = 2mks)

2. Scientific theory that explain origin of human beings.
i) Evolution theory.
(1 x 1 = 1mk)

3. One method of irrigation used in Egypt.
i) Shadoof.
ii) Canal.
iii) Basin.
(Any 1 x 1 = 1mk)

4. Two problems faced by traders when using barter system.
i) Some goods were not divisible into smaller quantities.
ii) Lack of double coincidence of wants.
iii) Difficult to determine the exact volume of some goods.
iv) Some goods were perishable/problem of storing the goods.
v) It was cumbersome to transport bulky goods.
(Any 2 x 1 = 2mks)

5. Two methods used to acquire slaves during the Trans-Atlantic Trade.
i) Slave traders kidnapped lonely travellers.
ii) Slaves were exchanged for European manufactured goods.
iii) Debtors were sold to slave traders.
iv) Some people were enticed and eventually sold into slavery.
v) Prisoners of war who had been captured during local wars were sold to slave traders.
vi) Through slave raids.
(Any 2 x 1 = 2mks)

6. Two disadvantages of using fire and smoke signals.
i) Can only be used to cover short distances.
ii) Range of messages passed was limited.
iii) It was affected by weather changes.
iv) The message could be missed if no one was on look out.
(Any 2 x 1 = 2mks)

7. One scientific discovery during the 19th century that contribute to food preservation.
i) Refrigeration.
ii) Canning.
iii) Pasteurization.
(Any 1 x 1 = 1mks)

8. One metal used as currency in Pre colonial Africa.
i) Gold
ii) Copper.
iii) Iron.
iv) Silver.
v) Bronze (Any 1 x 1 = 1mk)

9. Two factors that led to the growth of Athens as an urban centre.
i) It was surrounded by mountains and seas making it secure/security.
ii) It was a centre of learning and art which attracted people/ education centre.
iii) It was a religious/cultural centre/sport thus attracted many people.
iv) It was a trading central/commercial centre.
(Any 2 x 1 = 2mks)

10. State main function of the Golden stool.
- It was a symbol of unity.
(1 x 1 = 1mk)

11. One treaty signed between Lobengula and the British.
i) The Moffat treaty.

ii) Rudd concession
(Any 1 x 1 = 1mk)

12. Two chartered companies used to administer colonies.
i) Imperial British East Africa Company.
ii) British South African Company.
iii) German East African Company.
iv) Royal Niger Company.
(No mark for abbreviation)
(Any 2 x 1 = 2mks)

13. One political party that fought for independence in Ghana.
i) The united Gold Coast Convention (UGCC)
ii) The Convention Peoples Party. (CPP)
iii) The National League of the Gold Coast (NLGC)
(Any 1 x 1 = 1mk)

14. Two types of weapons used in cold war.
i) War of words/propaganda.
ii) Economic sanctions.
iii) Military assistance.
iv) Finance/technical Aid.
(Any 2 x 1 = 2mks)

15. Two ways in which NAM safeguard their national security.
i) By keeping off from conflicts of non-member countries.
ii) By maintaining their sovereignty/ independence.
iii) By maintaining their economic independence.
iv) By not identifying with either communism or capitalism.
v) By taking independent decisions/actions in international fora.
vi) By not joining military alliances.
(Any 2 x 1 = 2mks)

16. One financial institution established by African Union.
i) The Africa Monetary Fund.
ii) The African Central Bank.
iii) The African Investment Bank.
(Any 1 x 1 = 1mk)

17. One major political party in Britain.
i) The conservative party.
ii) The labour party. (Any 1 x 1 =1mk)

SECTION B (45 MARKS)

18a) Five ways in which the development of the upright posture improved the early man's way of life.
i) The early man was able to move/walk/run faster with long strides.
ii) Man could use the hands to carry out farming activities.
iii) Man could use the hands to grasp items conveniently.
iv) Man could spot/sight the animals/wild fruits which he used to hunt/gather from far distances.
v) Man could see the impending danger from distance and take appropriate measures.
vi) Man used hands to make tools/weapons which were used for different purposes.
vii) Man used the hands to defend himself/attack the enemies.
viii) Man used the hands to perform/carry out domestic chores/young ones.
(5 x 1 = 5mks)

b) Life of man in the old stone Age period.
= Tools and weapons.
1st phase man used olduwan/pebble tools.
2nd phase man use acheulian tools
= Tools were used for skinning, hunting, digging up roots, scrapping animal/skins cutting meat.
= Shelter man found shelter on top of trees, on rocky shelters, in cares, in think forest.
= Social group man lived in groups of about 20-30 people.
= Food - Hunting and gathering was the main economic activity of man.
= Communication - man used gestures, whistling and crick sound to communicate.
= Clothing - man work no cloth as he had not discovered to how to make one but their body was covered with for/hair which kept them worm.
(Any 6 x 2 = 12marks)

19a) Advantages of animal transport over human transport.
- Animals carry a wider load compared to human being.
- Animal have the ability to since danger
ckly.

unlike man.
- Can cover a longer distance compared to man.
- Human transport is slower compared to animal transport.
(Any other 3x1=3marks)

b) Factors which promoted plantation farming in Europe during the Agrarian Revolution.
- Invention of machines e.g seed drill.
- Discovery of farm inputs e.g fertilizers for improvement of soil fertility.
- Reclamation of waste land to make it productive.
- increase in population that provided enough labour on farm.
- Development of agricultural research.
- Discovery of pesticides & fungicides to cure crops and animal diseases.
(6 x 2 = 12mks)

20a) Why Mzilikazi welcomed the missionaries in Matebele land.
- The missionaries were friendly.
- They assisted him by repairing his guns.
- They helped him to inoculate his cows.
- They wrote and interpreted letters for him.
- They provided medical care to the sick.
(Any 3 x 1 = 3 marks)

b) Why Samori Toure was finally defeated by the French in 1898.
- Samori's people and army were constantly on the move and could not engage in any economic activity, they thus lacked adequate food supply.
- He lost Bure gold mines/reserves to the French and could therefore not sustain his army as before.
- He was cut off from Freetown where he bought ammunitions and guns.
- Africans societies failed to unite and support Samori against the French. He sought for alliance with Ahmed Seku of Tukolor and Tieba of Sikasso but to no avail.
- It was difficult to defend his second empire as it was open to attack on all side, either to the British or the French.
- He was attacked by the local communities whom he had earlier faced, during his retreat to the East.
- The local resistance also weakened him.
- The British refused to support him due to their policy of non-interference. He fought all alone.

21a) State three similarities between the French and the British structure of administration in Africa. (3mks)
i) Both had a governor as the chief executive of the colony;
ii) They had provinces as administrative units.
iii) Both had districts as administrative units.
iv) Both had locations as administrative units;
v) They had sub-locations.
(Any 3 x 1 = 3marks)

b) Explain six ways in which the application of direct rule in Zimbabwe affected the Africans. (10 marks)
i) African land was alienated for white settlement/lost land.
ii) People of Zimbabwe were oppressed and suppressed by administration - denied African movement.
iii) The African rules lost their political autonomy and served as puppet chiefs - BSAC was given too much powers.
iv) African cultures was undermine as Western education and Christianity, British legal system were introduced.
v) The mean of transport and communication were developed.
vi) The Africans were subjected to heavy taxation.
vii) The Africans were forced to supply labour to settles and public works and mines.
viii) The African elites were neglected leading to rise of nationalism.
ix) African traditional economy was disrupted as they worked for settlers.
x) New crops were introduced in Zimbabwe which became major crops.
xi) The British encouraged trade.
(6 x 2 = 12marks)

SECTION C (30 MARKS)

ANSWER ANY TWO QUESTIONS

22a) Economic activities of the Shona.

- Mixed farming - cultivated crops
- Reared animals.
- Practised trade - long distant trade.
- Skilful hunters - elephant for ivory.
- Skilled craftsmen - made spears, hoes, knives.

(Any 3 x 1 = 3mks)

b) Social organization of the Shona during the pre-colonial period. (12 marks)

- The community was divided into clans whose names were derived from animal names.
- They believed in a supreme god called Mwari/Mlimo/Mulungu or Lesa.
- They believed in ancestral spirits whom they consulted from time to time. The types of spirits included Vadzimu/family spirits, Mhondoro/ Clan spirits and Chamiruka or Chaminuka/national spirit.
- The Shona communicated with God through mediums, intermediaries or oracles e.g Chamiruka (national spirit) and Svikiro (departed family or clan elder).
- The priests presided over religious functions such as offering sacrifices to God.
- The Shona elders were highly respected.
- The priests came from the Rozwi clan.
- They had sacred places of worship e.g shrines where sacrifices were conducted.
- They lived in circular stone houses.
- They were polygamous in nature. Marriage between related clans was, however not allowed.
- They had a royal fire that was kept burning in the emperor's court.

23a) Five achievements of the League of Nations.

i) It promoted health services/established International Health Organisation.
ii) It championed for the welfare of the workers/ established the International Labour Organisation.
iii) It provided relief to refugees/war casualties/ areas hit by famine.
iv) It settled disputes between different European Countries.
v) It supervised mandated territories.
vi) It organized disarmament conferences in Europe.
vii) It helped to reduce trade in dangerous drugs.
viii) It helped in economic reconstruction of European countries.
(Any 5 x 1 = 5marks)

b) Explain the factors that have undermined the activities of the United Nations (UN)

i) Occurrence of natural catastrophes such as floods.
ii) Accumulation of arms by some states.
iii) Divided interest of some members.
iv) Global terrorism from groups such as Alovaeda.
v) Conflicting ideologies by different countries.
vi) Members concentrate more on matters of national interest than those of UN.
vii) Lack of standing military wing.
viii) Some members fail to remit their subscriptions to the UN.
(6 x 2 = 12mks)

24a) Identify three circumstances that may make a Vice President assume presidency in India.

i) When the sitting President dies.
ii) If the President becomes in capacitated.
iii) When the President resigns.
iv) When the President is removed or impeached.
(Any 3 x 1 = 3marks)

b) Six functions of the President of India.

i) The President is the head of state with executive powers to carry out his duties.
ii) The President seeks advice from parliament when appointing the Prime Ministers.
iii) He/she is the commander-in-chief of the armed forces.
iv) He is a member of the legislative.
v) He ascends to/vetoes bills before they become law.
vi) He establishes special councils to arbitrate on inter-state disputes.
vii) He dissolves parliament to call for general elections.
viii) He is empowered by the constitution to declare a state of emergency/rule the state by

(Any

decree when the security of the state is threatened.
ix) He nominates the 12 members to the "Council of states'/upper house.
x) He appoints state governors and supreme court judges.
xi) He calls the leader of the winning party after general elections to form the government.
xii) He is the leader of the political part that nominates him for the elections.
xiii) He pardons offenders.
(Any 6 well explained x 2 = 12 marks)

CHRISTIAN RELIGIOUS EDUCATION
PAPER 1
313 /1
MARKING SCHEME

1. a) ***Describe the first creation account. Genesis 1:2-4a*** (8marks)
   i. Before the creation the earth was formless and empty.
   ii. God created everything through a divine command ''.....let there be.....''
   iii. The work of creation took place in six days.
   iv. On the first day, God created light (day) and separated it from darkness (night).
   v. On the second day, He created the heavens and sky.
   vi. On the third day, the earth, seas and oceans and all types of plants were created.
   vii. On the fourth day, was the heavenly bodies (sun, moon and stars) were created to give light and determine time, seasons and years.
   viii. On the fifth day, God created water creatures and all kinds of birds.
   ix. On the sixth day, God created both wild and domestic animals. Human beings were created on the same day in the image and likeness of God.
   x. Human beings were given special privileges and responsibilities over other creatures.
   xi. God commanded human beings to procreate and multiply.
   xii. Everything that God created was good and pleasing to him.
   xiii. On the seven day, God rested and blessed it and made it holy (1 x 7 = 7 marks)

b) Seven attributes of God from the Biblical accounts of creation. (7marks)
   i. God is all powerful.
   ii. God has power over nature.
   iii. God is the only true God.
   iv. He is the sole creator
   v. God provides and sustains his creation.
   vi. God is triune (three in one).
   vii. God is God of Order.
   viii. He is good and perfect.
   ix. He is moral God.
   x. He is spirit.
   xi. God is a worker.
   xii. God is loving and caring.
   xiii. God is eternal.
   xiv. God is Holy.

xv. He is a God of mind and will. (1 x 7 = 7 marks)

c) ***Five ways in Christians continue with God's work of creation today.*** ***(5 marks)***

i. Through procreation and bringing up of children.
ii. By caring and conserving the environment.
iii. By protecting human rights and freedom.
iv. Through scientific and technological discoveries which help to improve human life.
v. By constructing dams and gabions.
vi. Through production of various types of energy for example, solar energy.
vii. Through reclamation of land.
viii. Through creation of employment opportunities.
ix. Through provision of medical facilities and services.
x. Taking care of the needy.
xi. Through farming.
xii. Through manufacturing of goods and services.
xiii. Through creative arts (1 x 5 = 5 marks)

2. a) ***Outline seven activities carried out by the Israelites on the Passover.***(7marks)

i. Every man chose a lamb or young goat for his family.
ii. The chosen animal was slaughtered.
iii. Blood was put on the door posts of the house.
iv. The slaughtered animal was to be roasted.
v. The Israelites ate the unleavened bread/bitter herbs /roasted meat.
vi. They ate while fully dressed for the journey/in a hurry.
vii. They stayed indoors till morning
viii. They burnt all the leftovers of the meal.
ix. They collected jewellery /clothing from Egyptians.(1 x 7 = 7 marks)

b) ***How the Israelites worshipped God when they were in the wilderness***. (7marks)

i. They built altars.
ii. They offered sacrifices.
iii. They sang songs /danced.
iv. They held festivals
v. They gave offerings /tithes.
vi. They constructed sacred places of worship/tabernacle.
vii. They observed the Sabbath day
viii. They burnt Incense. (1 x 7 = 7 marks)

c) ***Ways in which Christians can promote True worship of God.*** ***(6 marks)***

i. Praying for God's guidance
ii. Seeking guidance and counselling from church leaders on how to worship
iii. Reading the Bible
iv. Living exemplary lives for the others to emulate.
v. Contributing to the Church offerings.
vi. Repenting and forgiving one another
vii. Christians avoiding castigating one another in public during worship

viii. Attending Christian conferences.
ix. Providing theological training for the clergy.
x. Carrying out worship as provided by the legal framework of the state
xi. Allowing children to attend Sunday school for basic facts on Christianity.

(1 x 6 = 6 marks)

3. a) ***Describe the characteristics of the local Canaanite religion.*** (8marks)
   i. It was a polytheistic religion.
   ii. The gods were represented by images.
   iii. Sacrifices were offered to appease the gods.
   iv. The Canaanites constructed alters and high places of worship.
   v. Annual religious festivals were carried out.
   vi. Prophets and priests lead in worship.
   vii. In some cases human sacrifices were offered to the gods
   viii. Different gods controlled different natural forces.
   ix. Temple prostitution was practised.
   x. It was a cyclic religion
   xi. There was the believe that a god/goddess is only powerful in his/her own locality
   xii. Feasts were celebrated. (1 x 8= 8 marks)

b) ***Explain three commands which King Ahab and Queen Jezebel broke. (1 kings 21:17-29) (6 marks)***
   i. They broke the commandments of not to kill when they planned for the stoning of Naboth.
   ii. When they worshiped idols, they broke the rule of worshiping gods.
   iii. They broke the commandment of not coveting a neighbour's property when they wanted Naboth's vine yard.
   iv. The commandment of stealing was broken when they took Naboth's vineyard.
   v. The commandment of not to cheat /bear false witness was broken when they planned for false witness against Naboth.
   vi. They used the name of God in vain when they said that Naboth had blasphemed against God. (3 x 2 = 6 marks)

c) ***What life skills do Christians need to use in order to fight corruption in Kenya Today?***
   i. Critical thinking
   ii. Creative thinking
   iii. Decision making
   iv. Conflict resolution/problem solving
   v. Tolerance
   vi. Assertiveness/principled
   vii. Self-awareness
   viii. Empathy
   ix. Effective communication (1 x 6 = 6 marks)

4. a) ***Seven roles of prophets in the Old Testament.*** (7mks)
   i. They spoke on behalf of God/God's messengers/mouth pieces.
   ii. They foretold the future events.

iii. They guided/counselled the kings.
iv. They called people back to repentance /gave message of hope.
v. They reminded the people about the covenant
vi. They condemned the evil in the society.
vii. They warned the people of God's judgement.
viii. They made the people understand the nature of God.
ix. They offered sacrifices to God.
x. They anointed Kings.
xi. They interpreted the visions /dreams from God/current events (1 x 7 = 7 mks)

b) ***Eight teachings of prophet Amos about the day of the Lord.*** (8marks)

i. It will be a day of terror and disaster.
ii. God will punish the Israelites for their disobedience /He will remember their evil deeds.
iii. The earth shall tremble/ there will be earthquakes.
iv. People will mourn /no happiness.
v. There will be darkness at noon.
vi. The feasts and festivals will not be joyful.
vii. People will thirst/hunger for the word of God.
viii. People will faint in the process of searching for the word of God.
ix. It will be a day of disappointment for the Israelites.
x. The wicked will not escape God's judgement. (1 x 8 = 8 mks)

c) ***Relevance of the remnant and restoration to Christians today***. (5marks)

i. Christians as the remnants of God today should endeavour to do what is right before God and avoid negative Influences.
ii. Christians learn that God is merciful and forgives those who repent.
iii. Christians are encouraged because the righteous people will receive eternal life.
iv. The teaching on the remnants gives Christians hope that only unrepentant sinners will perish but the righteous will be rewarded with eternal life by God.
v. God always preserves a faithful remnant through whom he fulfils his promises to human kind. Christians are the remnants through whom God fulfils his purposes.

(1 x 5 = 5 marks)

5. (a) ***Describe the dedication of the wall of Jerusalem. (Nehemiah 2: 27-47)*** (8marks)

i. The wall of Jerusalem had been rebuilt and completed in 52 days.
ii. The Levites priests and the singers from the surrounding villages gathered in the city of Jerusalem.
iii. The priests, the people, the gates and the walls were purified.
iv. Ezra led a grand procession and moved around Jerusalem in a counter clock wise direction.
v. Nehemiah led another group clockwise around the city.
vi. Both groups came together in the temple square.
vii. There was singing, elaborate sacrifice rituals and rejoicing.
viii. Foreigners were not allowed to participate in the ceremonies

(1 x 8 = 8 marks)

b) ***Outline six messages of prophet Jeremiah in his letter to the exiles***. (6marks)

i. To build houses and live in them.
ii. To plant gardens and eat their produce.
iii. To marry and have children.
iv. To live in peace and promote the welfare of the cities where they were living.
v. To pray for their masters.
vi. Not to listen to the words of false prophets and diviners.
vii. God would restore them back to their land after seventy years.
viii. To trust in God and not to give up.
ix. God was accessible to them even in Babylon.
x. God would punish those who had remained in Judah for failing to listen to him.
(1 x 6 = 6 marks)

c) ***In what ways do Christians use the print media to spread the gospel?*** (6marks)

i. Publishing Christian Literature
ii. Distributing Christian literature free.
iii. Reading the Bible and other Christian literature.
iv. Using Biblical stories to produce Christian programmes in electric media.
v. Teaching using C.R.E textbooks.
vi. Selling Christian literature to institutions and to the public
vii. Advertising Christian issues in newspapers.
viii. Illustrating Christian messages and the episodes using the bible atlas.
ix. Using encyclopaedia and bible dictionaries to explain and interpret Christian terminologies.
x. Displaying posters with Christian messages.
xi. Printing Christian messages on various objects and items.
xii. Translating printed messages into local languages. (1 x 6 = 6 marks)

6. a) Six ***reasons why the initiates are secluded for a period of time in traditional African communities***. (6marks)

i. To facilitate the healing process of the initiates.
ii. To teach them moral values.
iii. To facilitate proper feeding for them.
iv. To enable them to adjust to the new independent life.
v. The isolation is rebirth from childhood.
vi. It promotes social interaction and the formation of the age set system.
vii. To learn the secrets of the community. (1 x 6 = 6marks)

b) ***Changes in initiation rites today***. (7marks)

i. Some initiation rites have been abandoned, for example, the removal of teeth.
ii. The rites are less elaborate.
iii. Some communities have adopted initiation rites from others.
iv. The times for initiation have been shifted due to formal schooling.
v. Many prefer to go for circumcision in hospitals.
vi. The age for initiation hasshifted from adolescent to young children.
vii. It is carried out at family level not communal in most cases.
viii. Female circumcision has been outlawed. (1 x 7 = 7 marks)

c) ***How the youth are prepared for adult life in the church in Kenya***. (7marks)

i. They are assigned duties to perform
ii. They are baptised and hence recognized.
iii. They are taught adult roles.
iv. Those who go against Christian life are punished.
v. They are given guidance and counselling services.
vi. They are helped to identify marriage partners.
vii. They form social groups to promote social skills in adult life.
viii. Some are appointed to leadership positions. (1 x 7 = 7 marks)

CHRISTIAN RELIGIOUS EDUCATION
313 /2
PAPER 2
MARKING SCHEME

1a)***DescribeProphet Nathan's prophecies concerning the messiah.*** (7marks)

i. He would be a descendant of King David.
ii. Establish an everlasting Kingdom
iii. Rule over Israel forever.
iv. Deliver Israel from her political enemies.
v. Always be supported by God.
vi. His Kingdom will be kept strong.
vii. Be a great King. (7 x 1) =7marks

b) ***Outline the message the of Zechariah in his hymn "the Benedictus" after naming John the Baptist. Luke 1: 67-79. (8marks)***

i. Zachariah praised the Lord of Israel for visiting his people to give them salvation.
ii. God will save his people from their enemies /those who hate them.
iii. God will perform mercy to their fathers in accordance to the holy covenant with Abraham.
iv. Those delivered from the hands of their enemies will serve the lord without fear in holiness and righteousness forever.
v. The child/ baby John will be called the prophet of the most high.
vi. He will prepare the people for the coming of the messiah.
vii. He will give them knowledge of salvation through forgiveness of their sins by the mercy of God the lord.
viii. God will give light to those who sit in darkness/shadow of death/guide their feet into the way of peace. (8 x 1 = 8 marks)

c) ***Explain the importance of singing in a Christian service. (6marks)***

i. It's an opportunity to praise/Adore God.
ii. Christians pass message/ pray through singing.
iii. Singing removes tension /makes worshippers relax.
iv. It creates an atmosphere of worship.
v. The singing removes boredom because of the varied activities during the service.
vi. God given talents are portrayed/enhanced during singing.
vii. Those who feel depressed are encouraged through singing.
viii. Non members are attracted to church through singing.

ix. Singing unites /brings worshippers together as they all join in chorus/singing.

(6 x 1 = 6 marks)

2a)*Explain the healing of the Gerasene Demonic (Luke 8: 26-39).* ***(6 marks)***

i. On the shores of LakeGerasene a demonic that was living in the tombs confronted Jesus and fell at His feet.
ii. He cried out and wondered what Jesus had to do with Him.
iii. The demons in the man requested Jesus not to destroy them but to drive them into the pigs making them to drown in the lake.
iv. The herdsmen reported the incident in the town.
v. The native requested Jesus to leave for they had fear of him.
vi. The healed man asked to accompany Jesus but was told to go and witness to others of his salvation.
vii. He went into the city and proclaimed about the mighty works of Jesus.

(6 x 1= 6 marks)

b) ***The qualities of a true disciple according to the teachings of Jesus. (8marks)***

i. Perseverance in the face of opposition.
ii. Unwavering faith in the face of opposition.
iii. Love for enemies.
iv. Obedient to Jesus' teachings.
v. Generosity where those who have should share with those who don't have.
vi. Self-criticism before judging others. They should avoid hypocrisy and examine themselves first.
vii. Being merciful to others as God is.
viii. Forgiving others.
ix. Fairness in passing judgement to others. (8 x 1 = 8 marks)

d) Lessons learnt from the healing of the Centurion servant. ***(6 marks)***

i. Christians learn to trust in God and Jesus always.
ii. To humble themselves before Jesus despite their positions.
iii. To serve all people equally without discrimination.
iv. To support the spread of the word of God with their resources.
v. To show Mercy to the suffering.
vi. To seek Jesus' help in the in case of trouble.
vii. To use the gift of the Holy spirit to heal the sick
viii. To provide charitable services to the needy.
ix. To assist / provide medical service. (6 x 1 = 6 Marks)

3a)*Describe the cleansing of the Temple by Jesus in Jerusalem (Luke 19:41-48)* ***(7 marks)***

i. Jesus wept when he reached Jerusalem because Jerusalem was going to reject him as the messiah.
ii. Jerusalem was the city of God. Jesus foresaw the judgement and destruction of the city of Jerusalem.
iii. Jesus also knew that he would suffer and die there just as God's messengers had.
iv. After wards Jesus entered the Temple and drove out the people he found carrying out trade.
v. He accused them of turning the Temple into the hideout of the thieves.

vi. Jesus protested because those who traded there hid the real meaning and use of the Temple.
vii. The action of driving out buyers and sellers from the Temple annoyed the Pharisees and other leaders.
viii. They plotted to kill Jesus (7 x 1= 7 marks)

b)***Preparation that Jesus made for the last supper (Luke 22: 7-14).***(8marks)
i. Jesus sent peter and John to prepare for the last supper/Passover.
ii. He instructed the two disciples to go into the city/Jerusalem.
iii. He told them that they would meet a man in the city carrying a jar of water.
iv. Jesus told them that they should follow the man into the house that he will enter.
v. Once in the house the disciples were to ask the owner/house holder to them the guest room.
vi. Jesus told the disciples that the owner would show them a large furnished upper room.
vii. He instructed the disciples to prepare the room.
viii. The disciples prepared the meal.
ix. Jesus together with the disciples sat down in the prepared room. (8 x 1 = 8 marks)

c)***Lessons Christians learn from Judas Iscariot's betrayal of Jesus.***(5marks)
i. To be aware of the forces against the work of God.
ii. Not to take vengeance against their enemies.
iii. To be peace makers.
iv. God is able to read the secret hearts of people.
v. What was prophesied by Jesus came to pass.
vi. Your betrayer is someone who knows you very well.
vii. Greed for money is dangerous/risky.
viii. Unwavering faith is crucial/integral in the life of a Christian.
ix. Christians need to resist temptations.
x. Pray always and at the time of trouble.
xi. Money is not everything it cannot buy life. (5 x 1 = 5 marks)

4a)*The teaching of Jesus about the vine and branches(John 15: 1-10).* ***(8 marks)***
i. God is the vine/dresser Jesus is the true vine.
ii. The followers of Jesus/Christians are the branches.
iii. Christians are related to God through Christ.
iv. The faithful Christians/fruitful branches are pruned so as to produce more fruits.
v. Christians can only do good things and bear fruits if they remain united to Christ.
vi. The unfaithful Christians are the unfruitful branches which are cut away /destroyed.
vii. Through Christ all Christians are joined to one another.
viii. Christians should rely on God for all providence.
ix. Love is passed on to Christians from God through Christ.
x. Christians should observe /keep God's commandments. (8 x 1 = 8 marks)

b)***The teachings of St. Paul on the unity of believers as expressed in the concept of the bride (2 cor. 11:2 , Rev 21:1-12***)7marks)
i. In the Old Testament, Israel was considered as the bride of God.
ii. In the New Testament Christians are the bride or New Jerusalem married to Christ.
iii. Christ is the divine bridegroom who seeks his bride', the Christians love and enters into a covenant relationship with God.

iv. Their marriage will be a lifelong union where there will be no suffering or death. They will live in peace and happiness forever.
v. Christians should prepare themselves to receive Christ who will return for His bride, the church.
vi. During the final establishment of the kingdom, God will take all believers/the Bride to the new home Heaven where they will live forever.
vii. Believers must obey God and do His will in order to be rewarded with eternal life.

(6 x 1 = 6 marks)

c)*The criteria for discerning the gifts of the Holy Spirit.* ***(6 marks)***

i. The manifestation of the Holy Spirit should conform to the teachings of the Bible.
ii. Genuine Christians who possess gifts of the Holy Spirit must be faithful to the authority of Jesus.
iii. One must accept Jesus as Lord to claim to be under the influence of the Holy Spirit.
iv. Manifestations of spiritual Gifts should be in the Context of Biblical truths.
v. One who is under the influence of the Holy Spirit has to bear the fruit of the spirit.
vi. Messages given through the inspiration of the Holy Spirit bring about peace and unity and not division among Christians.
vii. One who is under the influence of the Holy Spirit is sincere and honest.

(6 x 1 = 6 marks)

5a).*Ways in which Christians demonstrate responsible parenthood.* (6marks)

i. By providing the physical needs of the family i.e. food, shelter and clothing.
ii. Teaching/training their children on religious/spiritual matters.
iii. Helping their children to develop intellectually to acquire necessary skills/knowledge to realize their full potential on all aspects of life.
iv. Teach their children how to grow physically whenever they deviate from the norms.
v. Teach moral and the right behaviour to their children.
vi. Spending quality time with their children.
vii. Teach them social and civic responsibilities. (6 x 1 = 6 marks)

b*). Seven Christian teachings about work.* (7marks)

i. Christians should work in order to fulfil God's command.
ii. Those who do not work should not eat.
iii. Christians should work to provide basic needs.
iv. Christians should work in order to avoid sin/temptation/idleness.
v. People should work to help the poor/needy.
vi. People should work to subdue earth.
vii. Work should be balanced with rest, people should not be overworked.
viii. People should work so as to follow Christ's example/God
ix. Laziness is condemned.
x. Workers should be paid their dues /should not be exploited. (7 x 1 = 7 marks0

c) **Criteria which Christians use to choose appropriate leisure activities today.**(7 marks)

i. There should be a balance between active and passive leisure to avoid over indulgence.
ii. The choice of leisure activity should not negatively affect one and other people in the community.
iii. Leisure should only come after work as a form of rest and relaxation.
iv. One should consider only those activities that are moral and promote Christian principles.

v. Leisure that makes one to be extravagant should be avoided.
vi. One should reject those leisure activities that are dangerous to one's health.
vii. The principle of moderation should be applied in any leisure activity undertaken to avoid danger of addiction.
viii. One should engage in activities that promote service to others.
ix. Any leisure activity that has inbuilt risks should be avoided. (7 x 1 = 7 marks)

6a) ***Ways in which the church and the state work in harmony in Kenya today. (6marks)***

i. By encouraging church members to obey state laws.
ii. Reacting to and condemning evils in the society.
iii. Advising political leaders on just and fair ways of ruling people.
iv. Participating in reforms on laws that govern the state.
v. Using their democratic rights in the election of leaders.
vi. Participating in National development/ activities.
vii. Working in partnership to support victims of disasters.
viii. Inviting political leaders to participate in church activities.
ix. Being honest in paying taxes. (6 x 1 = 6 marks)

b) ***Problems related to the maintenance of law and order*** (7marks)

i. People are not conversant with the laws of the country.
ii. Poverty/economic inability make the poor to result to lawlessness to meet their needs.
iii. Unequal distribution of resources.
iv. Permissiveness in the society.
v. Some cultural believes/practises hinder effective maintenance of law.
vi. Delay in the delivery of justice to the offended.
vii. Politicians do not observe law /are poor role models.
viii. Tribalism/nepotism/religious affiliation/gender affiliation.
ix. Availability of dangerous weapons/guns in wrong hands leads to insecurity/
x. Greed power/material wealth.
xi. Inadequate Morden equipment to combat crime.
xii. Interference from the civil society /human rights groups /activities who oppose government initiative in maintenance of law and order.
xiii. Inadequate skilled personnel to handle issues to do with law breaking.
(7 x 1 = 7 marks)

c) ***Remedies that can be put in place to minimize ethnicity in Kenya today***.(7marks)

i. Showing Godly love to all like Jesus.
ii. Sensitizing people to appreciate and respect ethnic groups.
iii. Supporting educational and cultural programmes in a bid of promoting national unity.
iv. Discouraging tribalism through inter ethnic marriages.
v. Perpetrators of tribalism should be charged and punished according to the law.
vi. Creation of more National schools in the country so as to admit students from every part of the country.
vii. Use a common language in the country as a unifying factor.
viii. Encouraging domestic tourism through benefits of visiting different parts of the country.
(7 x 1 = 7 marks)

GEOGRAPHY
PAPER
321/1
MARKING SCHEME

1a) Geography applies chemistry to study the chemical composition of rocks/soil
- Geography use chemistry to explain chemical changes that take place in rocks/soils

b) X – Physiogeography
Y – Economic geography
Z – Demography

2a) Centripetal force
Centrifrigal force
Gravitational force
(Any 2 x 1 = 2 marks)

b) Revolution causes the four seasons.
Revolution causes changes in the position of the midday sun at different times of the year.
Revolution causes luna eclipse
Revolution causes varying length of day and night

3a) Water in the sea/lake is heated intensely by solar radiation
- Maximum heating occurs in the afternoon
- Moisture taken air above the water surface rises in convectional currents
- As the warm air rises it is cooled
- The moisture laden air condenses at high altitudes
- The condensed water vapour forms cumulo-nimbus clouds with time.
- The clouds give rise to heavy/torrential rain accompanied by thunder and lighting and sometimes hail stones known as convectional rainfall.

4a) Vulcanicity/magma within the crustal rocks.
- Tectonic plate movement
- Isostatic adjustment
- Energy release in the mantle

b) May lead to vertical and lateral displacement of parts of the earth's crust damaging transport and communication lines such as roads, railways and telephone lines.
- Earthquake occurring in densely settled areas may cause collapsing of buildings and loss of human life.
- Earthquakes occurring in oceans may cause Tsunamis causing flooding in lowlying coastal areas damaging property and loss of life.
- Earthquake may lead to occurrence of landslides damaging buildings/destroying agricultural land.

5 Mass of ice moves in the lowlands
- The ice this out as it melts

- The ice stops moving and deposits the boulders, clay beneath it.
- Ice abrasion and plucking reshapes the boulder day into rounded hills.
- Abrasion smoothens the upstream side of a hill forming rounded egg-shaped or elongated hills known as dmm/ms

MAPWORK (The map of Kitale)

6 i. Four proofs indicating the area receives high rainfall.

- Presence of permanent rivers i.e. R. Awach Tende
- Presence of natural forest e.g. Kodera forest.
- Human activities like coffee growing
- The dense population

(4 marks)

ii. Measure the length of all weather road from rigid reference 918418 to 930360. state the answer in kilometers and meters.

- 8 Km 500 m (2 marks)

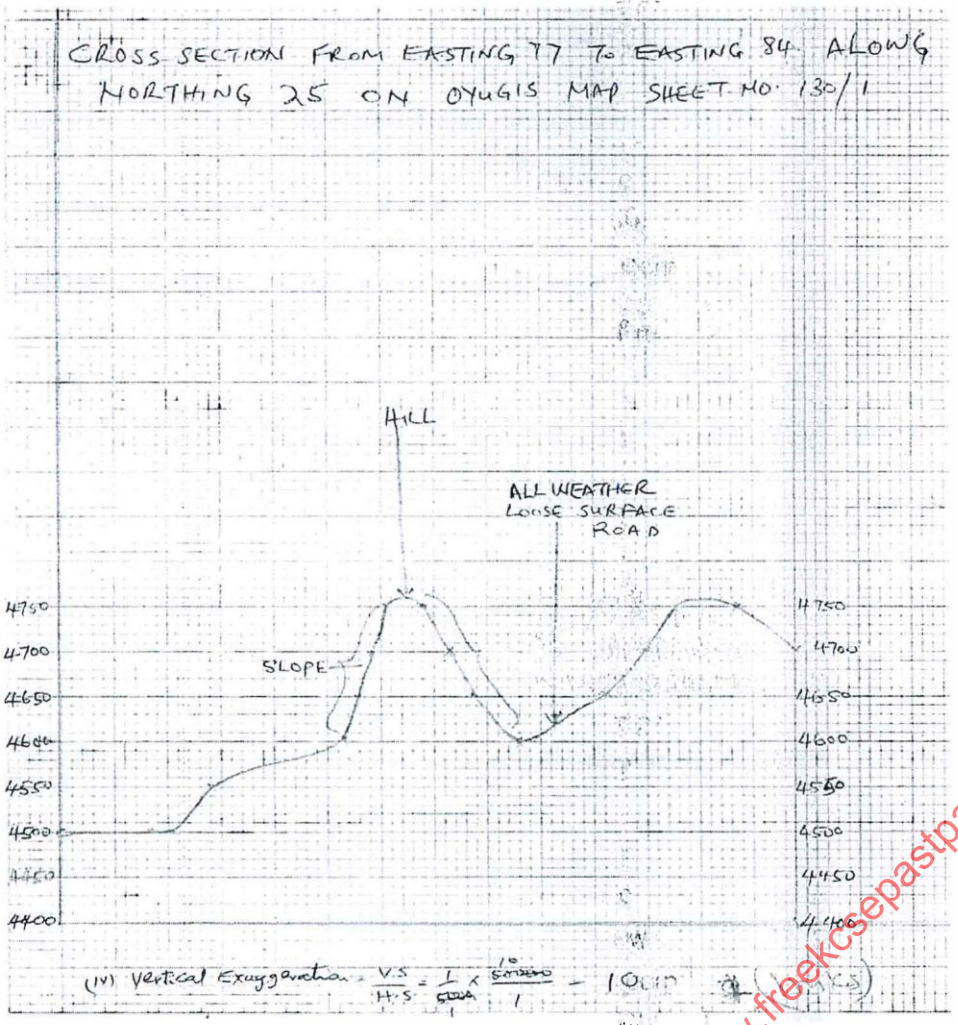
d. Describe the drainage of the area covered by the map.

- There are many permanent rivers in the area covered in the map.
- Some rivers drain in the swamp e.g Isanta
- Some rivers are disappearing in the underground at grid square 8419.
- Some rivers have formed dentritic pattern i.e R. Riana
- The main river is R. Riana
- Rivers on the southern side of the area covered by the map are flowing from East to the Western side of the

area covered by the map.

- Rivers in the Northern side of the area covered by the map are flowing Northward.

(4 marks)



7. Rock are naturally occurring aggregates of minerals particles forming part of the solid crust of the earth.

b)i) Three examples of intrusive igneous rocks

- Granite
- Peridotite
- Gabbro
- Syenite

(Any 3 x 1 = 3 marks)

ii) Three ways in sedimental rocks are formed;

Mechanically formed, where the rocks fragment are transported by wind, water or ice and they are deposited in layers and over a long period, of time the sediments are compacted into a hard rock.

- Organically formed rocks where the remains of plants and animals are deposited in layers such that over a long period of time, these remains are compacted into hard rocks.
- Chemically formed sedimentary rocks where the dissolved minerals are transported into water bodies, the dissolved sediments will precipitates/evaporates are then compacted to form a hard rock.

c)i) Formation of a sill

- Magma beneath the curst under high pressure and temperature. Earth movements causes formation of vertical or horizontal cracks/fissures in the crustal rocks
- The magma/molten rocks are forced out death high pressure through the cracks/fissures.

- The magma will cool and solidify in a horizontal crack or bedding plane to form a feature called a sill.

ii) Characteristics of a composite volcano.

- Composed of alternating layers of ash, pyroclasis and lava
- Volcano is conical in shape
- A volcano is steep sided
- A volcano has a peak with a caldera/crater/plug
- A volcano has concets/parasitic cones on its sides/have a side vent

A volcano has a vertical pipe/vent

d) Influence of volcanic mountains on human activities

- Volcanic mountains may be sources of major rivers providing water for domestic, industrial and irrigation purposes.
- Relief rainfall on the slopes of volcanic mountains support forests growth which are sources of valuable timber for building and construction.
- Volcanic rocks provide valuable materials for building and construction industry.

(Any 3 well explained x 2 = 6 marks)

8a) This is a semi-natural or derived vegetation which is a plant cover growing naturally in a place but has been interfered with people and is in the process of recovering from the interference.

b)i) Aspect

- There are a wide range of plants on the slopes forcing the sun and in the direction of rain bearing winds as they are warmer and wetter.
- Grass bands are dominant on the lieward side which are drier.

(Each 1 mark)

ii) Precipitation

- High rainfall areas have a large number of plants such as forests which are broad leaved to increase rate of transpiration.
- Areas with moderate rainfall are dominated by grasslands
- Areas with little rainfall have scarcity vegetation of scrubs and desert type

(Each 1 mark)

iii) Vegetation zones of Kenya

- Forests
- Savanna
- Semi-desert and desert
- Heath and moorland
- Swamp vegetation

c)i) D – Rainforests
E – Bamboo forests

F – Heath and moorland

ii) Characteristics of tropical savanna vegetation

- The vegetation consists of a mixture of grass and trees
- Wetter areas have woodlands with grass dominating
- Grass grow tall and closely together in some areas
- Where there is moderate rainfall grass grow tall upto 3m with shorter trees which are scattered.
- In drier areas the grass is shorter and tufted
- Grass is a dominant type of vegetation
- Trees are umbrella shaped
- Acacia are dominant tree species
- Some trees are stunted, Sealy barks and drought resistant
- Trees shed leaves during the dry season while grass wither and dries up
- The grass sprout and seeds germinate in wet seasons
- Some tree species have long tap roots which reach deep in the ground water
- Some tree species like baobab have thick stems to store food and water for the plants
- A long river valleys there are tall trees and thick bushes.

(Any 6 x 1 = 6 marks)

d) Significance of vegetation

- Vegetation is of aesthetic value as it adds value to the landscape making it conducive for people
- Vegetation binds the soils together protecting it from erosion by wind and rain water
- Vegetation partly decay forming humus making soil fertile for agriculture
- Some plants roots, barks and leaves are used as medicine used to cure and treat different human diseases.
- Some fibrous plants such as sisal which are used for rope, sucks and mats making which are sold to earn income to people.
- Latex from rubber trees is used for manufacture of rubber used in tire manufacture.
- Some plants are eaten by people as food.

(Any 4 x 1 = 4 marks)

9a)i) A low lying large track of alluvium deposited at mouth of a river

ii) The river must carry a large load of sediments from its catchment area to be deposited at the river mouth.

- The river course should be free of obstacles such as swamps or lakes which would act as filters and remove some of the sediments the river is carrying.
- The velocity of the river should be very low at the point where it is entering the sea so that deposition takes place.
- The rate of deposition should be faster than the rate at which materials are being removed.

iii) Examples of Arcuate deltas in Africa

- Tana delta at the mouth of R. Tana in Kenya
- Sondu delta at the mouth of R. Sondu in Kenya
- Rufiji delta in Tanzania

- Nile delta in Egypt
- Niger delta in Nigeria

iv) Other types of deltas
- Birds fort delta
- Estuarine delta
- Inland delta

(Any 2 x 1 = 2 marks)

b) Abrasion
- River water carries sand, gravel and boulder/load
- The land is used as a tool for scouring
- The load is hunted by the river water against the tanks and drugged along the river bed
- The load ships off the rocks on the banks and smoothen the river bed.

(Any 3 x 1 = 3 marks)

Hydraulic action
- River water is forced into cracks of rocks on the river banks/river bed
- Air is compressed into the cracks on the rocks
- This creates pressure which widens the cracks
- The pressure in the cracks is suddenly released as the water retreat from the cracks
- Continued compression and release of water widens the cracks and eventually cause the rocks to shatter.
- The retreating water removes the loosened particles and transport them downstream.

c) Ways in which gorges are formed
- Where a river flows along a line of weakness/less resistant rocsk
- Whether a river maintains its course across a landscape which is being uplifted slowly.
- Where a river flows across a plateau composed of alternate layers of land and soft rocks.
- Where a water fall retreats upstream

(Any 3 x 1 = 3 marks)

d)i)
- Develops in areas where rocks have a uniform structure
- The direction of flow is influenced by the slopes of the land
- The tributaries join the main river at acute angles
- The tributaries join the main river forming a shape like that of a tree and its branches.

ii) River floods leads to loss of life and drowning
- Some rivers form communication barriers making communication difficult and expensive
- Stagnant river water cause water borne diseases.
- Rivers with water falls/rapids hampers transport
- Some rivers are home of dangerous animals such as hippo, crocodiles which are a risk to human and domestic animals life.

10a) Soil texture is the size distribution of minerals particles composed in the soil while soil structure is the way individual soil particles are arranged and joined to form lumps or clusters.

OR

Soil texture is the coarseness and finess of soil grains while soil structure is the arrangement of soil particles to form destructive shapes

b)i) Soil water
Soil air
Mineral particles/weathered materials/inorganic matter
Living organisms

ii) Improves the textures of soil/binds soil particles together
- Improves/adds soil fertility
- Enables soil to retain moisture
- Facilitates aeration of soil
- Source of food for soil micro-organisms which regulate soil temperature

iii) Continuous irrigation: Causes leaching of soil nutrients making the top soil deficient of soluble minerals causing soil salinity.
- Overgrazing: lead to removal of vegetation cover thus exposing soil to agents of erosion which will remove the top fertile soil.
- Over cultivation: weakens soil structure making it easy for agents of soil erosion carrying away the top fertile soil.
- May also increase oxidation resulting to loss of organic matter.

c) Physical degeneration
- Chemical degeneration
- Biological degeneration

d) The plant leaves covers and reduces the force of the raindrops controlling splash erosion
- The vegetation cover increases the rate of rain water infiltration into the soil reducing surface run-off controlling sheet erosion.
- The roots of plants increase the rate of rain water percolating into the soil controlling erosion.
- The plant roots binds the soil particles together thus controlling erosion
- Plant cover reduces the rate of soil water evaporation making the soil moist/wet and compact.
- Dealt and decaying vegetation matter adds more humus to the soil making the soil particles bound together reducing erosion.

GEOGRAPHY
PAPER
312/2
MARKING SCHEME

1. (a) **Forest and Forestry.** (2 marks)
- A forest is a continuous growth of trees and undergrowth covering a large area of land.
- Forestry is the science of planting, caring and using trees/forests or their associated resources.

Or the practice of managing and using trees/forests/their associated resources.

(b) **Benefits of Agro-forestry.** (3 marks)
- It provides fodder for the animals.
- Trees act as wind breakers/provide shade to young plants.
- Farm products are a source of income to the farmers.
- Trees conserve soil.
- Trees provide raw materials for industries.
- It is a source of fruits/food for human consumption.
- It conserves forests/to ensure continuous supply of wood fuel.

2. (a) **Urbanization** : It is the process whereby an increasing number of the total population in a country settles in towns . (2marks)

(b) **Factors which have led to the development of Mombasa as a major sea port in the region**
- It has deep sheltered harbour
- It has fine weather throughout the year
- It has a large hinterland
- It is located at a straight point on the East
- It is well linked to the interior by railway, road and air
- Early settlement/early trade by Arabs/old port

3. (a) **Causes of international migration.** (2 marks)
- Better employment opportunities.
- High standards of living.
- Shortage of food in a country/famine.
- Outbreak of civil wars in a country.
- Political/religious persecution.
- Religious pilgrimage.
- Leisure or recreational activities as tourists.
- International government appointments/assignments such as diplomats/peace keeping missions.

(b) **Factors responsible for the low fertility rate in Sweden.** (3 marks)
- Widespread use of family planning methods.
- Improved medical facilities leading to high survival rates among children.
- More women are involved in employment thus child bearing is an impediment to the persuit of careers.

4. (a) **Economic benefits of Southern African Development Co-operation (SADC) to member states.** (2 marks)

- Promoted trade through removal of obstacles that hinder free movement of goods.
- Created more employment opportunities by promoting free movement of labour.
- Created wider market for goods promoting industrial and agricultural activities.
- It has promoted transfer of technology leading to production of quality goods.
- Provision of capital for development through the finance and investment co-ordinating office based in South Africa.

(b) **Measures that Kenya can take in order to reduce her unfavourable balance of trade.** (3 marks)

- Encourage development of Jua Kali industries which don't require importation of heavy machinery.
- Restrict importation of luxury items through taxation.
- Establish import substitute industries to cut down on importation of some commodities.
- Develop alternative sources of energy to reduce importation of petroleum.
- Encourage production of high quality manufactured goods in order to earn higher income.
- Diversify agricultural exports.
- Opening new markers to avoid dependence on traditional trading partners

5. a) **Ways through which minerals occur on the earth crust** (2 marks)

- Veins and lodes
- Beds and seams
- Alluvial deposits
- Weathering products

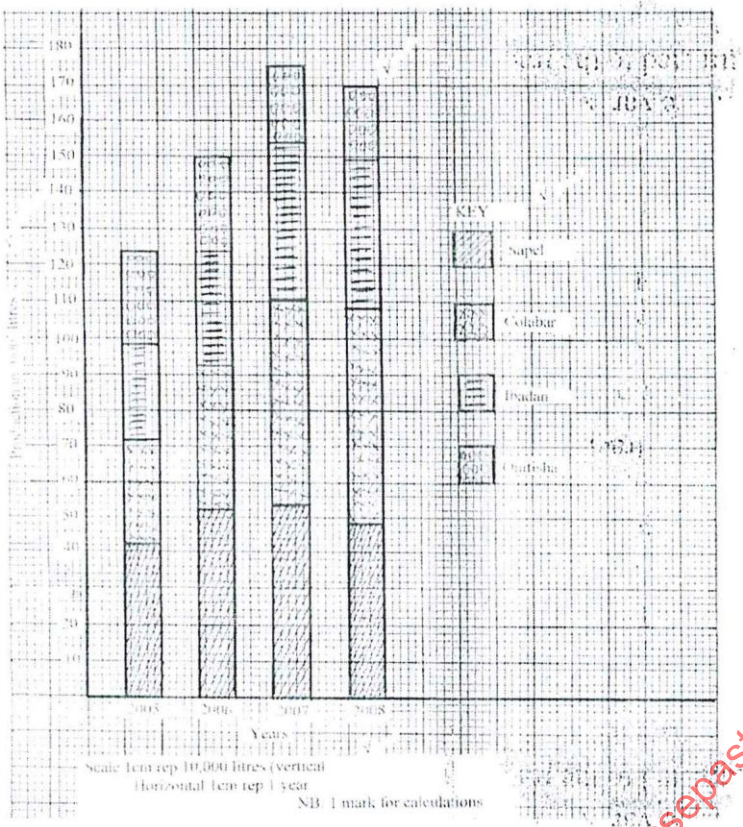
b) **Effects of mining on the environment** **(3 marks)**

- Causes land dereliction
- Causes air, noise and water pollution
- Underground mining is a health hazard due to collapsing of mines.
- Lower water table.

SECTION B

6. (a) (i) Graph

COMPOUND BAR GRAPH REPRESENTING PALM OIL PRODUCTION BETWEEN THE YEAR 2005 AND 2008 ('000' LITRES)



(ii)

- The vertical scale starts from zero
- Axes are clearly labeled
- The independent variables are usually placed on horizontal axis (x)
- Dependant variables are placed on vertical axis
- The bars must be distinct
- Each bar is sub-divided into segments/portions
- The bars are of the same width
- Must have a title
- Must have scales

1 x 3 = 3mks

(b)

- High temperatures throughout the year (20^0C– 26^0C)
- High rainfall which is vertically distributed throughout the year
- Deep porous well drained soils
- Plenty of sunshine
- High relative humidity
- Undulating topography

Any 3 x 1 = 3mks

(c) (i)

- Temperature ranging from 18^0C to 27^0C
- 20 weeks free of frost to allow maturity and harvesting
- Moderate rainfall between 600 – 1100mm for optimum growth
- Well drained and fertile soils
- Undulating topography to allow use of machinery

2 x 3 = 6mks

(ii) - Narok
- Nakuru
- Uasin Gishu
- Laikipia
- Bungoma
- Vihiga

1 x 2 = 2mks

(iii) - Practiced near urban areas
- Farms are small
- Intensive cultivation of land
- Application of manual labour
- Scientific management use of fertilizers insecticides etc
- Application of irrigation to facilitate production
- It is export oriented

1 x 4 = 4mks

7. 10. (a) (i) Canada (1mk)

(ii) – The convergence of the warm and cold currents causes upwelling of ocean water which brings minerals for planktons to the surface attracting large number of fish to the area
- The convergence of warm and cold current modifies the temperature of the ocean water making the area ideal for fishing throughout the year
- The cool waters favours survival of wide variety of fish species which make the area an important fishing grounds

2 x 2 = 4mks

(b) – The area has a broad shallow continental shelf, which provide suitable conditions for the growth of planktons used by fish for food
- The region experiences low temperatures that are favourable for the survival of fish, for preservation of fish
- The hinterland is densely populated thus providing ready market for the fish
- Advanced technology has resulted in highly developed ship building to carry out large scale fishing
- The intended coastline provides ideal fish breeding sites or sheltered bays which are ideal for setting up fishing villages and ports

3 x 2 = 6mks

(c) (i) There are numerous inland fishing grounds such as lakes and rivers which are accessible to many people.
- There is low demand for sea fish compared to fresh fish making fresh water fishing more preferable.
- The narrow continental shelf along the coast of East Africa limits the growth of planktons thus limiting the breeding of fish.
- The stiff competition in the open sea from the industrialized countries whose fishermen used modern fishing equipment discourage local fishermen
- The limited technology and inadequate capital make it difficult to develop marine fishing

3 x 2 = 6mks

(ii) – A bag shaped net is attached to a ship

- The net is cast into the water by the trawler
- The nets mouth is kept open by otter boards and head bean
- The upper part of the net is kept a float by corks or floats
- Weights are used to keep the lower part of the net at the sea level/sea bed
- The trawler drags the net along the sea bed
- After sufficient fish has been caught the net is hauled unto trawler to empty the fish 1 x 5 = 5mks

(iii) – Canning
- Freezing
- Smoking
- Salting
- Sun drying

3 x 1 = 3mks

8. (a) (i) **DOMESTIC TOURISM.** The act where people/citizens visit places of interest for sight-seeing and leisure within the country.

(ii) **Why the Kenyan government encourages domestic tourism.** (3 marks)
- To utilize facilities such as hotels and lodges during the low tourist seasons.
- The government encourages tourism in order for Kenyans to learn more about their own country.
- The government encourages tourism to facilitate interaction between different communities and therefore enhance national unity and integration.
- To create more employment opportunities to citizens therefore improve standards of living.
- It offers opportunities for recreation.
- To promote circulation of money in the country.

(b) (i) **Tourist attractions found at the coast of Kenya.** (3 marks)
- Sandy beaches/coral reefs.
- Sunny/warm climate/warm conditions/sunbathing
- Historical sites and monuments e.g. fort Jesus/Gedi ruins/Vasco Dagama pillar.
- Traditional culture of the people/dances/shrines.
- Water sports e.g. yatching, surfing, goggling and sport fishing.
- Marine parks/wildlife/mangrove forest.
- Caves like Shimoni caves/cliffs/coral reef

(ii) **Measures that Kenya should take in order to attract more tourists.** (8 marks)
- Improving infrastructure/roads/airports/communications to all tourist-sites in order to make them easily accessible.
- Improving security to ensure the safety of the tourist is guaranteed.
- Marketing the country more aggressively in order to make it more known/improve the image of the country abroad.
- Establishing a diversity of tourist attractions/emphasis on ecotourism to avoid depending entirely on the traditional attractions/reduce competition with other tourist destination.
- Establishing/modernizing tourist facilities in areas that have high potential such as Western Kenya where such facilities are inadequate.

- Intensify domestic marketing to reduce reliance on foreign tourists.
- Improve/train more personnel to serve tourists better/sensitize citizens on the need to be hospitable to tourists.

(c) Differences between the tourist attractions in Kenya and Switzerland under the following sub-headings:

- **Security** (2 marks)
  - In Kenya, some areas have rampant insecurity which scares away tourists while in Switzerland there is a peaceful atmosphere/political neutrality which encourage tourists.

- **Culture** (2 marks)
  - In Kenya there are varied/a diversity of African cultures while in Switzerland tourists are attracted to the traditional swiss hospitality and many European languages spoken.

- **Sceneries.** (2 marks)
  - In Kenya, there are varied sceneries such as snow capped mountains, Rift Valley, Sandy leaches while in Switzerland has varied sceneries such as glaciated mountains, cascading waterfalls clear blue skies etc.

(d) Ways through which wildlife is conserved in Kenya. (3 marks)

- Encouraging individuals to set up game ranches.
- Banning of trade in wildlife products.
- Encouraging wildlife conservation education.
- Employing anti-poaching unit in the game parks
- Protecting the endangered species in orphanages.
- Establishing game reserves/national parks/ forest reserves.
- Translocation/culling/game cropping.

9. (a) (i) What is industrial inertia? (2 marks)
   - The tendency of an industry to remain in a particular area even when the original locational factors/advantages are no longer important.

   (ii) Causes of industrial inertia. (2 marks)
   - Availability of experienced workers.
   - Availability of well developed transport and communication system already in place.
   - It is expensive to move t a new site.
   - Industrial independence

(b) Explain how the following factors influence the location of industries.

- **Market** (4 marks)
  - Industries which manufacture perishable products are located near the market to minimize on wastage.
  - Industries which manufacture fragile products are located near the market to

reduce on damage during transit.

- Industries which manufacture bulky finished products are located near the market to reduce the cost of transport.

- **Transport and communication** (4 marks)
  - Industries are sited near transport lines to reduce on the cost of production.
  - Well developed transport and communication network attract industries because

    finished products reach the market faster/limited spoilage.
  - Efficient means of communication speeds up transactions leading to increase volume of production.

(c) **Benefits which Kenya has derived from industrialization.** (8 marks)

- Kenya exports goods thus earn foreign exchange used to develop other sectors of the economy.
- Taxes on industrial goods/industries earns revenue to the government used to develop other sectors of the economy.
- Industrialization has created employment opportunities leading to improved standards of living/reduced unemployment in the country.
- Development of transport and communication network which has facilitated the development of other sectors of the economy.
- Increased agricultural production because some industries use agricultural materials as raw materials.
- Industrialization has led to acquisition of technical and managerial skills which are used in other sectors of the economy/enhance expansion of industries.
- Industrialization has led to reduction of importation on some industrial goods thus save foreign exchange used to develop other sectors of the economy.
- Industrialization has led to the growth/expansion of urban centres as labour migrants to the urban centres.
- It has led to the production of goods which are on demand in the country thus leads to improved standards of living.

(d) Advantages of decentralization of industries in Kenya. (5 marks)

- It encourages regional equality in development.
- It creates employment opportunities in the rural areas.
- It reduces on rural-urban migration.
- It allows for greater exploitation of local resources.
- It reduces risks during calamities.
- It helps to reduce strain on social amenities in the urban centres.
- It helps to raise the standards of living of people.
- It helps reduce congestion in the urban centres.

10. **a)** i) <u>Methods of reclamation</u>

- Irrigation
- Tsetse fly control
- Planting of trees / afforestation
- Flood control **any 2 × 1 = 2 marks**

ii) Methods of swamp drainage
- Construction of drainage pipes.
- Digging open ditches / canals.
- Pumping out water. **any 2 × 1 = 2 marks**

b) i) Two rivers that supply water to Mwea
- Thiba River
- Nyamindi river
- Murubaru river. **any 2 × 1 = 2 marks**

ii) Factors influencing establishment of Mwea irrigation scheme

Topography
- The gently slopping / undurating land makes it possible for water to flow by gravity onto / out of the irrigated land.
- The gently slopping land allows for mechanization which allows large areas to be put under cultivation. **any 1 × 2 = 2 marks**

Soils
- Presence of black cotton soil which retains water for a long time suitable for cultivation of rice . **any 1 × 2 = 2 marks**

Population
- The area was originally sparsely populated which enabled large areas to be put under cultivation / very few people were displaced thus it as cheaper to start the scheme. **any 1 × 2 = 2 marks**

Government policy

There was need to keep political detainees busy / use them to provide free labour. This made the colonial government to set up Mwea where scheme there was a large detention camp. **any 1 × 2 = 2 marks**

c) i) Three areas of Zuider zee project
- North Eastern folder
- South Flavoland
- East flavoland
- Markerward
- Wie ringer meer polder. **any 3 × 1 = 3 marks**

ii) Differences between land reclamation in Kenya and Netherlands.
- In Kenya the reclaimed land is relatively small while areas reclaimed in the Netherlands are large.
- In Kenya irrigation is used as a means of reclaiming dry areas while irrigation in the Netherlands is used to lower salinity of the soil in reclaimed lands.
- In Kenya simple methods like digging canals ditches to drain water from the land while in the Netherlands highly advanced methods like draining land from the sea/ creating a poider are used.

- In Kenya dykes are used to control water floods while in the Netherlands dykes protect the reclaimed land from invasion by the sea.
- In Kenya land is reclaimed from marginal areas and swamps while in the Netherlands it is from the sea.
- Drought resistant crops are planted in marginal areas while in the Netherlands hardy crops lie oats, barley are planted in the polders.
- In Kenya there is low market for irrigated crops while in the Netherlands there is a large market for irrigated crops.

any 4 × 2 = 8 marks Comparison must be complete to score.

BUSINESS STUDIES
JULY / AUGUST
MARKING SCHEME

1. Highlight four negative effects of production activities on the environment and community health. (4 marks)

-water pollution
-air pollution
-noise pollution
-destruction/degradation of the environment
-solid waste pollution *Any 4 @1=4*

2. Outline four reasons why there is a lot of government support on the activities of entrepreneurs in Kenyan today. (4 marks)

-entrepreneurship enhances optimal utilization of available resources
-leads to creation of wide variety of goods and services
-leads to the development of entrepreneurial cuture
-promotes technology
-reduces foreign dominance of the economy
- improves infrastructure
-reduces rural-urban migration
-creates employment opportunities *Any 4 @1=4*

3. State four reasons why human beings satisfy their basic wants before the secondary wants. (4 marks)

-basic wants cannot be postponed
- they are felt needs
-they are needed for survival/one cannot do without them
-resources are scarce
-they are satisfied before secondary wants *Any 4 @1=4*

4. State the names of the equipments that fit the description given below: (4 marks)

a) Paper shredder
b) Cash register
c) Franking machine
d) Fax machine **each@*1 =4***

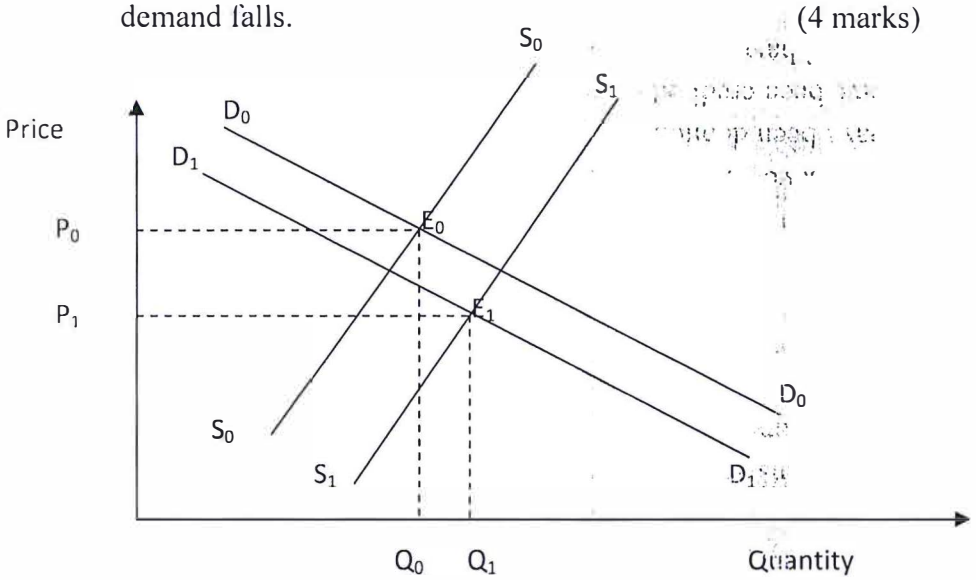
5. Outline four ways in which a firm can improve the productivity of human resources (4 marks)
-provide workers with more education and training
-provide good working conditions/environment
-pay workers well/ good salaries/ remuneration
-promotion of workers
-provide adequate tools and equipments
-staff welfare e.g. medical care
-ensure good relationship between workers ***Any 4 @1=4***

6. State four advantages of processing zones (EPZ) to a country. (4 marks)
-encourages exports
-attracts foreign investors
-creates market for locally produced raw materials
-creates job opportunities
-stimulates industrialization
-earns government revenue after the tax free period ***Any 4 @1=4***

7. List four essential elements of a transport system. (4 marks)
-unit of carriage - vessel
-method of propulsion - source of power
-way – path where vessel may pass
e) -terminals – loading/ offloading points ***each@1 =4***

8. Sukem o Enterprises intends to promote its products to increase sales volume. Highlight any four circumstances under which the business would choose to use personal selling. (4 marks)
-when launching a new product
-when a product is tailored to meet customer specifications
-when the value of the product is high
-when the organization can afford to finance the sales force
-when the market is concentrated in one area
-when it is necessary to demonstrate the use or operation of the product
-when a product whose quality has been improved is being re-launched in the market
Any 4 @1=4

9. Using a diagram show the effect on equilibrium price and quantity when supply increases and demand falls. (4 marks)



10. Outline four roles played by the stock exchange market in the economy. (4 marks)
-facilitates buying and selling of shares
-safeguarding investors interest
-providing useful information
-assists companies to raise capital
-creation of employment
-raising revenue for the government
-availing a variety of securities
-fixing the prices of securities
-measure country's economic progress
-promotes culture of saving

Any 4 @1=4

11. Explain the meaning of the following terms as used in insurance. (4 marks)
Cover Note: document given by the insurer to the insured on payment of the first premium while policy is being processed
ii)Surrender value: amount of money refunded by the insurer to the insured if he/she decides to terminate the contract before it has matured
iii)Pure risk: a risk which results in loss if it occurs and no gain if it does not occur
iv)Sum insured/assured: value for which insurance cover is taken as stated on the policy

Each @1 =4

12. Outline four causes of breakdown in communication. (4 marks)
-language barrier/difficult language
-poor listening skills
-negative attitude towards the sender/recipient of message
-poor timing
-wrong choice of medium
-prejudgement /premature evaluation by recipient
-emotional responses
-noise
-unfamiliar non verbal signals

-unclear systems within the organization
-where technical jargon is used to people who do not understand it
-where channels are overloaded ***Any 4 @1=4***

13. Highlight four factors that may limit the effectiveness of bank rate in controlling credit. (4 marks)
-underdeveloped money markets leading to a few monetary transactions
-extra reserves by commercial, hence no need to approach Central Bank for discounting
-savings may be done for safety reasons not for earning interest
-few potential borrowers hence charged bank rate would not have much effect
-people may borrow from other financial institutions, eg microfinance, saccos
-people may save elsewhere eg saccos ***Any 4 @1=4***

14. For each of the following transactions, state the account t be debited and the account to be credited. (4 marks)

	A/c debited	**A/c credited**
i)	Drawings	Cash
ii)	Purchases	Bank
iii)	Cash	Capital
iv)	Ouma (creditor)	Bank

15. Outline four advantages of privatization. (4 marks)
-privatized parastatals will be more efficient in production as they cut their operational costs to maximize profits
-the money got from the sale of such parastatals is a source of government revenue
-leads to competition thus enhancing efficiency
-offers private citizens an opportunity to participate in business by becoming shareholders
-helps attract foreign investment
-the management becomes more accountable to their shareholders
-the government earns revenue from taxing privatized firms
-helps attract foreign aid
-Government is able to concentrate on other state responsibilities ***Any 4 @1=4***

16. Outline four positive implications of a youthful population to an economy. (4 marks)
-youthful population provides a high labour supply
-the labour is highly mobile
-there is high demand for goods and services used by the youth
-results in a lot of creativity and innovation ***Any 4 @1=4***

17. Outline four ways in which consumers are likely to suffer in a situation where there is no warehousing. (4 marks)
-consumers will not be assured of steady flow of goods
-quality of goods may be compromised
-prices are likely to be unstable
-consumers may not get goods in convenient quantities since bulk will not be broken
-consumers may not enjoy reduced prices from economics of scae
-lack of time utility in goods

-lack of variety of goods *Any 4 @1=4*

18. Fill the blanks in the table below: (4 marks)
    a) To enquire on goods available
    b) To request the seller to supply the goods specified
    c) Seller
    d) Debit note

19. Give any four reasons why small scale firms continue to exist in an economy dominated by large scale firms. (4 marks)
    -size of the market served being small
    -nature of the product, can only be produced in small scale
    -simplicity of the organization
    -flexibility of small firms
    -quick decision making
    -belief that a small firm is more manageable
    -legal constraints barring growth of firms
    -require less capital to start and run/ lack of capital to expand
    -high risks faced by large firms
    -limitation of business acumen and management skills
    -few legal formalities
    -need to retain control *Any 4 @1=4*

20. Outline four characteristics of an Oligopolistic market structure (4 marks)
    -dominated by a few large sellers
    -there are barriers to entry
    -products are the same but usually differentiated
    -usually there is collusion in the industry
    -firms are mutually interdependent
    -firms usually engage in non-price competition
    -price set tends to be rigid *Any 4 @1=4*

21.

Menja Traders
Trial Balance
As at 31st December 2014

Details (Account Title)	**Dr**	**Cr**
	Ksh	Ksh
Sales		100,000
Purchase	170,000	
Returns Inwards	10,000	
Returns Outwards		20,000
Salaries	30,000	
Capital		40,000
Bank loan		50,000
Total	**210,000**	**210,000**

22. Outline four ways that the World Bank may use to assist developing countries to improve their economies. (4 marks)

-by following up on their development plans and challenges facing them
-giving medium and long term loans to countries
-ensuring loans are put to good use, proper allocation/management of funds
-guaranteeing loans obtained from other financial institutions
-providing technical assistance to member countries where necessary ***Any 4 @1=4***

23. Identify transactions that were wrongly entered in the cash book (4 marks)

-May 3: Purchases of shs. 1520 should have been credited
-May 2: Sales of shs. 1640 should have been debited
May 4: Wages of shs. 500 should have been credited
May 12: rent received of shs. 830 should have been debited ***Each @1 =4***

24. Calculate the consumer price index for 2010-2013 using 2009 as the base year(4 marks)

2010: $\frac{36}{30} \times 100 = 120$

2011: $\frac{42}{30} \times 100 = 140$

2012: $\frac{47}{30} \times 100 = 156.67$

2013: $\frac{52}{30} \times 100 = 173.33$ ***Each @1 =4***

25. Mumo Enterprises had a working capital of Ksh 300,000 and a current ratio of 4:3 as at 30th June 2016. Calculate the firm's

iii) Current assets (2 marks)
iv) Current liabilities (2 marks)

Let CA (Current Assets) be x and CL (Current Liabilities) be y
CA:CL=x:y
x/y=4/3 OR x=4/3y
WC =CA-CL
x-y=300,000
4/3y-y=300,000
1/3y=300,000
Y=900,000 (Current liabilities)
x =y+300,000= 1,200,000 (Current Assets)

BUSINESS STUDIES
565/2
JULY/AUGUST 2018
MARKING SCHEME

1a)**Five factors that may have contributed to the slow pace in the achievement of most African trade agreements.**

a) **Different political ideologies.** Countries have different political ideologies which make it difficult for them to harmonize their economic strategies.
b) **Use of different currencies.** Some countries dominate others e.g. Ugandans prefer Kenyan shillings to others
c) **Nature of export products/ similar products.** The countries tend to produce similar products which make it difficult to trade with on other.
d) **Infrastructure/ poor transport network and communication**. The underdeveloped infrastructure among the member countries hinders the movement of goods and services for efficient trade.
e) **External/foreign/ outside interference.** Non -member countries most of which are developed countries, impose some conditions thatare not conducive to the promotion of trade among the member countries e.g imposing liberalization policy.
f) **Different levels of development.** There are countries at different levels of development and some feel that some member countries benefit more than others.
g) **Political instability/civil wars.** Some countries have internal political problems/ upheavals/conflicts which make it difficult to participate fully in multi-lateral trade.
h) **Funds.** Some member countries do not meet their financial obligations to the agreement secretariat hence hampering body.
i) **Mistrust/ suspicion.** The political leadership lacks the political will to integrate the member countries' economies.

b) **Five personal attributes of an office worker.**

a) **Hygiene**. The office worker must maintain a high level of hygiene. For example, in general and body cleanliness.

b) **Posture.** An office worker must adopt a good posture i.e. the way one carries himself around, way of walking, talking and sitting.

c) **Good health**. Good health and physical fitness will enable an office worker to perform his work efficiently.

d) **Physical appearance** such as respectable style of dressing, moderate haircut styles and use of make-ups.

e) **Moral behaviour**. An office worker should display high standards of moral behavior.

Attribute = 1 marks
Explain the attribute fully – 2 marks
5 x 2 = 10 marks

2(a) Causes of the income disparity

a) ***Difference in natural resources endowment*** makes some areas more productive hence people in such areas have high income compared to people in deprived areas.
b) **Inheritance.** Some acquire wealth obtained from their parents and generate more thus become rich.
c) **Corruption**. Some people acquire wealth through unscrupulous ways and grow rich.
d) **Difference in individual talents** makes those endowed to use them and earn income.
e) **Nepotism.** Rewarding members of one's family with job opportunities leads to some people being affluent than others.
f) **Crime**. Some engage in criminal activities to acquire wealth thus generates more out of it.

Cause = 1mark, explanation = 1mark 5@ 2marks = 10marks

(b) Reasons for continued government interest in operating public corporations.

a) **To prevent foreign dominance of the economy**.By starting Public Corporations to invest in areas where locals are not able to.
b) **To create employment opportunities in the country**. Parastatals create employment to Kenyans because they engage in production of goods and services. Government is interested in reducing unemployment in the country.
c) **To provide essential goods and services to its citizens**. Public Corporations provide essential goods and services such as water, health, education which is a core obligation of any government.
d) **To venture into businesses where private sector is unwilling**. Some private sector is unwilling to venture due to low profits or high risks involved.
e) **To attract foreign investment**. By imitating major business projects through public corporations.
f) **To engage in businesses which private sector** is unable due to large amounts of capital required to start them.
g) **To stimulate economic development in the country** e.g. by providing social services.
h) **To engage in businesses that are too sensitive** to be left at the hands of private sector e.g. firearms.

Naming – 1mk Otherwise – 2mks

3a

DATE	PARTICULARS	DR	CR
2016 June 3rd	Weighing machine Makenji wholesalers (purchase of a weighing machine on credit from Makenji wholesalers)	60 000	60 000
June 4th	Motor vehicle Capital (conversion of personal car for business use)	500 000	500 000
Jun 7th	Onyango Tractor (sale of tractor on credit to Onyango)	75 000	75 000
June 20th	Kagumo Kigumo	10 000	10 000

	(correction of wrong debit entry to Kigumo)		
June 25th	Heshima P&L A/C Furniture (sale of book shelf on credit at a loss)	76 000 4 000	 80 000
June 28th	Tommy Furniture P&L A/C (sale of a table on credit at a profit)	3 500	 3 000 500

3 b)**Factors that may have led to a higher proportion of income contributed by primary level**

a) **Capital deficiency/ inadequate finance.**Primary level requires less expenditure to generate income than other levels. Therefore the country finds herself relying more on primary level of production.

b) **Availability of natural resources.**The country may be endowed with natural resource which may be easier to exploit e.g minerals, fertile land.

c) **Availability of unskilled labour.** The production of goods at primary level may not require skilled labour which is required at both secondary and tertiary levels of production. the unskilled labour is readily available and cheap to employ.

d) **Level of technology/ inadequate technology.** The country may be lacking adequate technology to produce at secondary and tertiary levels.

e) **Climatic/ weather conditions.** The climate of the country could have given it a comparative advantage in production of agricultural products in primary level of production.

f) **Large size of subsistence sector.** This makes the country concentrate more on the primary level.

4(a)Trends in road transport in Kenya

a) Coming up with overhead by-passes to reduce congestion and jam particularly at round about.
b) Private personal vehicles with less capacity e.g. four seater vehicles are used to transport people from one place to another.
c) Coming up with matatusaccos to encourage the matatu operators to save/ borrow loans at low interest rates.
d) Alco-blow to discourage drivers from driving drivers from driving while drunk.
e) Introduction of safety belts to reduce the severance of injury in case of accident.
f) Introduction of speed governors to reduce the speed of matatus.
g) Introduction of yellow lines on PSV vehecles with route numbers for easy identification by customers.
h) Uniforms for touts and drivers for easy identification by customers.
i) Introduction of closed circuit television(CCTV) for road surveillance.

4(b) Measures that a country may take to ensure proper development planning.

a) Develop and implement realistic / achievable / appropriate plans that are easy to implement / should not adopt plans that are difficult to implement.
b) Avoid reliance on donor funding to implement the plans – should try as much as possible to fund development projects from own resources because if donor funding is not forthcoming, implementation of the projects becomes difficult.

c) Involve local people / community in formation and implementation of the plans to ensure their full support.
d) Ensure there are adequate resources to implement the plans i.e. human resources, financial resources, capital equipment and technological resource.
e) Gather adequate and accurate data e.g. of population size of structure, levels of individual and national incomes etc so that it is reliable in formulation of the plans.
f) Ensure support and participation of private sector as a partner in development so that the government and private sector pursue similar objection.

Naming – 1mk Otherwise – 2mks)

5a)**Challenges to under population of the country.**

a) Limited labour supply to carry out production activities.
b) Limited market – a small population may not offer enough market for goods and services. It may even lead to closure of existing businesses.
c) Underutilization of available resources – some of available resources may be unexploited due to lack of people to make use of them.
d) Uneconomical to provide goods and services – the cost of providing essentials and social amenities by the government may be very high to a small population and especially if the population is scattered.
e) Lack of specialization which leads to production of low quality goods and services. Citizens therefore have low standards of living.
f) Owing to lack of /less competition and underutilization of available resources, citizens are not creative and innovative which reduces phase of economic growth and development.

Naming –1mk Otherwise – 2mks

5. b**) Benefits of the conversion**

a) **Quoted in the stock exchange market.** This allows free trading of shares thus can raise higher capital through floating them
b) More capital raised. It has a wider base of selling shares so raises more money from shares
c) Continuous life span. The company is not easily dissolved so can run for longer period.
d) Advice from capital market. The company receives expertise advice that can be used to improve efficiency
e) Can diversify activities since has capital can involve in different types of activities for they can afford.
f) **More ideas**since it has more shareholders who can contribute better ideas for efficiency.
g) Shareholders enjoy limited liability which is not the case with partnership business. The shareholders are not liable to the company's debts beyond the amount due on the shares they hold.

Benefit must be clearly state

Mention = 1mark Explanation – 1mark 5 X 2 = 10 marks.

6a**. Circumstances that would influence a producer to use wholesalers in distributing farm produce.**

a) **Where the producer requires storage/specialized storage**, for safety of goods/ facilitates continuous productivity to save on storage costs.
b) Where the producer wants to reduce the cost of **preparing goods for sale**.e.g by break bulking, customers getting goods in small quantities, thus reducing the cost of bulk breaking

c) Where goods need to be **distributed far/** where the market is **expansive/ wide** since the producer may not be able to cover or reach the whole market.

d) Where the producer **would want to get feedback on the market** and yet the cost is higher as the wholesaler may **reach more consumers**

e) Where the producer would want to engage wholesalers to assist with **advertisement so as to save on costs. (sales promotion)**

f) Where the producer requires/ lacks transport thus being relived/ **saving on cost**

g) Where the producer wants to sell in bulk, since wholesalers can afford **to sell more/ faster.**

h) Where the producer requires ready cash/ finances since; wholesalers can buy in **cash to raise working capital.**

i) Where it is a **government policy** to distribute through wholesalers, then the producer would **have no alternative.**

j) Where the **market risks** are many/ high since the wholesaler **can bear some of the risks.**

k) Where the producer needs **to concentrate/ specialize on production**, then the distribution can be handled by wholesalers.

l) Where the producer needs to maintain **fewer / less records**, by dealing with wholesalers **who are few.**

6.b)

BARCA INVESTMENTS✓

Trading Profit and Loss A/C

for the period ended 31-12-2014

Purchases		420,000	Sales	980,000✓
Less returns		32,000✓	Less: Returns	25,000✓
Goods available		388,000		955,000
Less: closing stock		54,000✓		
Cost of sales		334,000✓		
Gross profit		621,000✓		
		955,000		955,000
EXPENSES			Gross Profit b/d	621,000
Discount allowed		40,000	Discounts received	36,000✓
Salaries	140,000✓		Rent	40,000✓
Add: accrued	26,000✓	166,000		697,000
Insurance	86,000✓			
Less prepaid	10,000✓	76,000		
Total expenses		282,000		
Net profit c/d		415,000✓		
		697,000		697,000
			Net profit b/d	415,000✓✓

18 x ⅓= 6 Marks

BARCA INVESTMENTS
BALANCE AS AT 31.12.2014✓

Building	800,000✓	Capital	581,000✓
Cash	90,000✓	Add Net profit	415,000✓
Bank	320,000✓		
Debtors	256,000✓	Loan	340,000✓
Insurance	10,000✓	Creditors	168,000✓
Stock	54,000✓	Salaries accrued	26,000✓
	1,530.000		1,530.000

16 x ¼ = 4 marks

443/1
AGRICULTURE
MARKING SCHEME

1. Four farming practices that help to reduce the effect of water shortage in crops
   - Mulching
   - Adding organic matter
   - Growing drought tolerant crops
   - Ridging the seed bed (4x ½ =2mks)

2. Four characteristics of shifting cultivation
   - When fertility of the soil goes down crops are not grown again until fertility is restored.
   - Plenty of land is available to the farming community
   - Practicable with annual crops not with the perennials.
   - Agricultural output from the whole system is low / subsistence production.
   - Input such as pesticides, fungicides fertilizer are rarely used / build up of pests and diseases is avoided by periodic movements to the new lands.
   - Use of simple hand tools. (4x ½ =2mks)

3.Importance of sub soiling
   - Important in breaking up the hardpans in areas where they have formed after primary cultivation (1x1)

4. Four advantages of tissue culture.
   - Lead to production of pathogen free plants
   - used in production of propagules.
   - Fast and requires less space
   - Higher annual yield per unit area of land (3x ½ = 2mks)

5.four benefits of optmum soil temperature
   - Enhance seed germination
   - Enhances plant growth.

- Enhance soil microbial activities
- Improves quality of crops e.g. Tea, pineapples. (2x ½ =2mks)

6. Four factors that influence soil productivity
   - Soil depth / drainage / aeration
   - Water holding capacity
   - Level of nutrients / cation exchange
   - Soil pH/ Soil borne – pests and diseases (4x ½ =2mks)

7. Three characteristics of fixed inputs
   - Quality used does not vary with level of production
   - They are not allocated to specific enterprise
   - The cost value is not used in calculation of gross margin

(½ x3)

8. Four factors that determine depth of ploughing
   - Type of crop/rooting system of crop to be grown.
   - Type of implement available.
   - Type of soil.
   - Soil moisture content at ploughing time
   - Presence of certain weeds e.g. cough grass. (4x ½ =2mks

9. Two main methods of conveying water
   -Transporting in containers.
   -Piping / use of channels (1X2= 2mks)

10. Difference between seed dormancy and seed viability
    - Dormancy- is the inability of seed to geminate even if conditions for germination are provided.
    - Seed viability- is the measure of how many seeds are alive and can be able to germinate given the necessary conditions

(1X2= 2mks)

11. Four factors that determine spacing
    -Soil moisture content
    - Seed size.
    - Soil type.
    - Type of germination
    - Soil moisture content
    - Soil fertility.
    - Machinery to be used.
    - Intended use of the crop.
    - Growth habit
    - Prevalence of pests and diseases.
    - Cropping system used. (4x ½ =2mks)

12. Meaning of terms as used in forage establishment.

(a) Topping
- Removal of stemy fibrous material left over after a period of grazing to allow new pasture to regrow.

(1x1)

(b) ley pasture

- Highly productive pasture composed largely of grasses and clovers

(1x1)

(c) Rest period

- The period within which you stop grazing so that pasture can regenerate.

(1x1)

13 Causes of blossom end rot

a) Irregular watering of the crop/ water stress

Excess application of Nitrogen in early stages

Deficiency of element calcium in young fruits ($^1/_2$x 3= 1$^1/_2$mks)

b). control of blossom end rot

- Regular watering
- Addition of calcium into the soil (1/2 mk)

14.(a) Afforestation is the practice of growing trees in areas where they had not existed,

(b) Re- afforestation is the practice of growing trees where they have been harvested. (2X1 = 2 mks)

15. Factors that contribute to competitive ability of weeds

- Produce large quantities of seeds
- Seeds remain viable for along time
- They have effective mechanisms of dispersal
- Some weeds have the ability to propagate both by seeds and vegetatively.
- They have elaborate root system.
- Some have underground structures difficult to control.
- Some are able to survive with limited nutrients.
- Some are able to compress their life cycle.
- Some weeds are allelopathic. (4x ½ =2mks)

16 four types of micro catchments

- Crossed strip catchment
- Mound micro catchment
- Runoff strips
- Contour bench- terraces system
- Catchment basins
- Contour stone bunds
- negarims

(4x½=2 mks)

SECTION B (20MKS)

17. (a) Capillarity (1mk)

(b) Properties of soil J.

- Well aerated
- Porous
- Low amount of humus

- Well drained (4x½ =2 mks)

(c) L- It has high water holding capacity required in paddy rice (2mks)

18.

(d) method of compost making

Indore method (1mk)

(e) factors to consider when sitting the structure

- well drained place
- direction of prevailing wind
- size of the farm
- accessibility
- topography (4x½ =2 mks)

(f) Function of the following materials in preparation of compost manure.

(iii) Top soil (1mk)

- Introduces microorganism necessary for decomposition of organic material.

(iv) Wood ash

- Improve level of phosphorous and pottasium in resulting manure

19. i) Chitting/sprouting. (1x1 = 1mk)

ii) - Humidity/moist environment

- Diffuse light.(NB Avoid dark room). (1x2 = 2mks)

iii) – Ensure uniform growth after selection.

- To ensure growth commences immediately after planting.
- To break seed dormancy. (2x1 = 2mks)

20 .a) Identity of structure.

Cut off drain 1 mk

b) Identity of parts labelled L and M.

L – Embankment/ridge

M – Channel/trench (2mks)

c) How part labelled L is stabilized after construction.

Through planting grass on it. (1mk)

d) One factor determining the width and depth of the structure.

The expected volume of run-off.

The bedrock/soil type. 1x1 = 1mk

SECTION C (40MKS)

21. i)Planting

Time of sowing

- Timely planting should be observed.
- Before onset of heavy rains
- Early maturing planted in short rains
- Late maturing planted at start of long rains.
- Plant Certified seeds.
- Innoculate seeds with nitroculture to boost nodulation

- Depth of planting 3-5 cm
- Spaced at 60 cm x15cm

-Apply phosphatic fertilizer at planting (2 marks)

Any 5 correct points(1x5 =5 marks

ii. Weed control

- The field should be kept weed free throughout the crop growing period. First weeding is first carried out 2-3 weeks after emergence of the crop.
- Avoid weeding during the flowering stage so as not to knock down flowers

(2x1 = 2 marks)

iii. Harvesting

- Harvest after 3-4 months
- Is done when all pods have turned brown or hard but before the pods start shattering away seeds.
- Small scale farmers usually harvest beans by uprooting whole plant.
- Dry the beans on bare earth, mats to a moisture content of 10% then dust with Actellic.
- Thresh and winnow to obtain clean bean seeds.

(1x5=5 marks

(b)

- Time is wasted in movement: the cause of distance between parcels.
- Difficult to properly and efficiently control weeds and pests. This is because fragments are usually surrounded by people holding neglected.
- Difficult to follow up sound farm plan; because of distance between fragments and farmers home.
- Difficult to supervise scattered plots. Labour force knows that you are usually absent.
- Control of parasite and pests in difficulty; because animal spread as they move between plots.
- Difficult in getting agricultural extension services. Extension workers don't concentrate well with the farmer.
- Difficult in carrying out soil conservation measures. Any attempt is destroyed by run off from neighbouring fields.
- Agricultural production is less. This is the net result of above problems.

(Naming 4x1 = 4, Explanation 4x1 = 4, total 8mks)

22. a) Advantages of budgeting in farming.

- It helps the farmer in decision making.
- It enables the farmer to predict future returns so as to plan ahead.
- It helps the farmer to avoid incurring losses by investing in less profitable enterprises.
- It enables farmers to secure loans from financial institutions.
- It ensures a periodic analysis of the farm business.
- It acts as a record which can be used for future reference.
- It pinpoints efficiency or weaknesses farm operations.

Any 5pts x 2mk = 5mks

b) Types of risks and uncertainties.

- Fluctuation of commodity prices.

- Physical yield uncertainty – dues not known how much to expect.
- Ownership uncertainty – The farmer lose part or whole of the produce through theft, fire or death.
- Outbreak of pests and diseases.
- Sickness and injury uncertainty.
- New production technique and uncertainty.
- Obsolescence – A farmer may invest in machinery which may become outdated.
- Natural catastrophes e.g. floods, drought, earthquakes, storms and strong winds.

Any 5pts x 1mk = 5mks

c) Importance of pruning perennial crops e.g. Tea, coffee.

- To regulate quantity and quality of fruits or flowers
- In tea pruning is done to stop the upwards growth of the plant to allow the sideways growth hence making plucking of the leaves easy
- To remove all branches broken, dead pr diseased.
- To permit air circulation and secure more light for most parts of crop.
- To remove branches and fruits that rub against each other.
- To make certain field operations easier and effective e.g. spraying(1x5 =5 marks)

23. Effects of liberalization of Agriculture markets to farming in Kenya.

- Flooding of local market with cheaply produced products such as sugar from Brazil.
- Countries like Kenya have subsidized production costs produce cheap agriculture products therefore may not export some of these commodities resulting to low income.
- Some companies have closed down rendering most people jobless.
- Developing countries like Kenya can now market their products to other countries which due to their climatic conditions cannot produce the same products.
- Agricultural inputs can be acquired from cheaper sources that are nearer and cheaper.
- Bilateral trades relations do not have to have strings attached.
- Lead to diversification of Agriculture commodities.

(5x2=10 marks)

(b) How price is determined in a free market situation.

- Prices are determined by the supply and demand forces in the market.
- When price is high supply is high but the demand is low. When the price is too low the supply is also low, but the demand is high.
- When quantity demanded is equal to quantity supplied then this is an equilibrium price. There's no competition among supplier and consumers because both parties are satisfied.

(1x3=3 marks)

(c) How government policies affect agricultural production

- Heavy taxation of imports in order to protect local industries.
- Subsidising the growing of locally produced commodities. This makes commodities cheap and affordable by farmers.
- Quality controls i.e. controls the production of high quality goods for export and domestic markets.
- Conservation of natural resources to sustain agriculture.
- Stepping up the control of diseases and parasites that affect crops and livestock e.g by imposing of quarantine, vaccination of animals.
- Motivating agriculture extension workers so that they can disseminate modern farming techniques.
- Encouraging and providing farmers training.

(1x7 = 7 marks)

443/2
AGRICULTURE
PAPER TWO
MARKING SCHEME

SECTION A (30 marks)

1. -Aberdeen Angus (1 × 1=1mk)
2. -Makes it easy to select for breeding
   -Facilitates treatment of sick animals
   -Facilitates culling of poor animals
   -Facilitates identification for special feeding.
   -Facilitates individual assessment of animals by record keeping. (5 × ½=2 ½ mks)
   -Makes easy to trace animals if lost or stolen.
3. -Oval in shape
   -Brown in colour /white in colour
   -Smooth shelled
   -Should be clean
   -Should have an average weight of 57 grammes (4 × ½ =2mks)
4. (a) -Species
   -breed
   -Age
   -sex
   -skin colour (4 × ½ =2mks)
   (b) -Isolation in separation and confinement of sick animals from healthy animals to prevent disease infection and spread.
   -Quarantine is restriction of movement of animals and their products from and into an area in which a notifiable disease as broken out.
   Mark as a whole (1 × 1= 1)mark

C) mud Snail / water snail, cattle/ pig; **(2 x ½ = (1mk)**

5. -Prevents moisture from rising up the wall. (1 × ½ mk)

6. -Restlessness
   -Enlargement of the vulva
   -Slackening of the muscles on the sides of the tail.
   -Loss of appetite
   -Enlargement of the udder and teats
   -Collection of beddings at a corner to make a nest. (5 × ½ =2 ½ mks)
7. Reasons for raddling . (2 x1=2 mks)
   -Help to identify ewes that have been served.
   -Help to identify rams that have served a particular ewe.
   -Help to identify infertile ewes and rams.
8. -Vaginitis -Brucellosis/contagious abortion /bangs disease.
   -Trichonomiasis -Orchtis (2 × ½ 1 mk)
9. -Dung is used as fuel

-Used to provide meat / milk /food
-Long bones are used for making tents
-Hides used in leather industry
- provide transport
- for recreation purposes (4 × ½ =2 mks)

10. Three harmful effects of ticks. (1/2x 3=1 1/2 mk)
-Suck blood from host animal leading to anaemia.
-Cause wounds through bites which acts as routes for secondary infection.
-Cause irritation through their bites.
-Their bites lower value of hides and skin.
- Some ticks produce toxins that may cause adverse effects.

11. factors when siting farm structures. (4x1/2=2 mk)
- Location of the homestead. –Relationship between structures.
- Accessibility -Farmer's taste and preference.
-Security drainage -Proximity to amenities.
-Direction of the prevailing wind -Topography of an area.

12 Categories of farm tools. (4x1/2=2mk)
-Garden tools and equipment.
-Workshop tools and equipment.
-Livestock production tools and equipment.
-Masonry tools and equipment.
-Plumbing tools and equipment.

13 Reasons for proper care of tools and equipment. (4x1/2=2mk)
-To increase durability. -To reduce replacement cost.
-To increase efficiency . -To avoid injury to the user .
-To avoid damage to the tool.

14 Cause of cannibalism.(4x ½ =2 mks)
-Presence of external parasites. -Overcrowding.
-Bright light. -Prolapse -Introduction of new bird in a flock. -Mineral deficiency.

15.Difference between rip and tenon saw. (1 mk)
Rip saw is used for cutting along the grains of wood while tenon saw is used for fine sawing and small cutting work e.g. joints

16 Two diseases controlled by vaccines. (1 mk)
-Foot and mouth
- Rabies
- Rinderpest
- Anthrax
- Black water

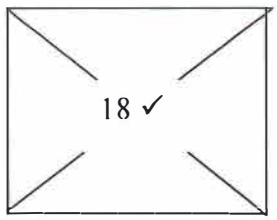
17 Broiler and capon. (1/2x2=1mk)
Broiler is a bird kept for meat production while capon is a castrated male bird.

18. Advantages of embryo transplant. (2x1/2=1mk)
- A highly productive female animal can be spread over a wide area.
- Its easier to transport embryos in test-tubes than a whole animal.
- Embryos can be stored for long periods before transplant .

- It stimulates milk production in a female not ready to produce. /Stimulate milk production in an infertile high yielding female
- Its possible to implant embryos from high quality female to less valuable one.

SECTION B (40 MKS)

19. a)



$\frac{12\ parts}{58\ total\ parts}$ ✓ (4 x ½ = 2)

Maize Meal $\frac{46}{58} \times 200$ ✓ = 158.6 ✓

Fish meal $\frac{12}{58} \times 200$ ✓ = 41.4 ✓ (4 x ½ = 2)

b) - Vitamins
- Mineral elements / salts (2 x ½ = 1)

20. (a) A-Burdizzo (1 × 1=1 mk)
B- Watering can (2× 1/2=1 mk)

(b) -Straightening bent metal surfaces.
-Riveting
-Stinking head of cold chisel. (1 ×1=1 mk)

(c) -clean after use to remove dirt.
-Greasing to reduce friction
-Sharpen blunt blade to facilitate cutting.
Mark as a whole (2 × 1=2 mks)

21. (a) A- Seminal vesicles
B – Prostate gland (Reject prostrate gland)
C – Sperm duets

(b) B – Secretes a fluid that neutralizes acidity in the urethra.
D – Stores spermatozoa temporarily
F- Passage of semen
-passage of semen (3 × ½ =1 ½ mks)

(c) -Located outside the body to ensure proper tempratures for spermatogenesis.
-Contraction of the scrotal sac pulling the testis closer to the body in cold weather for them to attain the proper tempratures for spermatogenesis. (1x2=2mk)

22. i) Environmental problem in each brooder. (1x3=3mk)
A Brooder is cold ,Chicks crowd around heat source.
B Excess heat, Chicks move away from the heat source.
C Draught from one side.

ii) Two ways of overcoming B. (1x2=2mk)

- Reducing the amount of heat.
- Proper ventilation of the brooder.
- Open windows to allow cool air into the brooder.
- Located between legs for protection against shock and injury.

(SECTION C 40 MKS)

23 a)

- Shortages of food and water forces the bees to migrate in search of the same
- Disease outbreak
- Attacked by pests /predators
- Bad smell
- Overcrowding in the hive
- Infertile queen
- Sick or death queen (1x5 = 5 mks)
- Excess heat in the hive (6x1=6mks)

b) - Any sudden change in routine
- Parasite infections
- Lack of food & water
- Strangers & predators in the birds house
- Sudden noise such as passing tractors/thunder
- Poor handling of birds during routine practices
- Over crowding which leads to completing for space
- Weather changes
- Poor lighting in poultry house
- Inadequate laying nest
- Disease infection 10 x 1 = 10mks

c) - Making boundaries
- Avoid land disputes
- Keep off wild animals & intruders / provide security
- Allow practice of mixed farming
- Facilitate rotational grazing
- Control animal movement in the farm
- Isolate or confine animal that require special attention
- Control breeding by paddocking
- Hedges act as windbreakers
- Add beauty to the farm
- Add value
- For privacy 5 x 1 = 5mks

24. (a) Advantages of farm mechanization
-Makes operations timely and faster
- Makes work easier and enjoyable / reduce drudgery.
- High quality job is done than human labour
-There is increased efficiency

-Pests and diseases outbreak can be controlled relatively in a shorter time.
-Farmers benefit from economies of scale
-Economical in times of labour demand
-High yields are achieved because farm operations are carried out on time.

(5 x 1 = 5mrks)

b) Maintenance of a water cooling system of a tractor
-Water pump should be lubricated regularly
-Clean water should be used in the radiator to trash removed from the fins
-All pipes should be filter highly to avoid leakage
-The radiator should be filled with clean water before starting the days work.
-The fan belt tension should be checked regularly and if too-light or too loose should be adjusted accordingly.

(5 x 1 = 5 mrks)

(c) (i) Cattle, sheep, goats, pigs and wild animals which are cloven footed.

(2x1 = 2mrks)

(ii) Causal agent;
- Virus **(1x1 = 1mk)**

(iii) **Symptoms of the diseases.**
-The animal develops high temperature
-The animal has a staring coat
-There are discharges in the mouth and nose.
-the eyes appear watery.
-there is diarrhea and dysentery
-the mucous membranes of the mouth and nose become red. Also develop wounds or ulcers.
-Animals become emaciated.
-Animals do ground their teeth
-Death occurs in two – ten days after incubation in acute cases but may live for three more weeks in less acute cases.

(4 x 1 = 4mrks)

(iv) **Control measures.**
- Vaccination every six months.
- quarantine measures be applied.
- Kill all affected animals
- Nurse animals with disinfectants on wounds. Antibiotics prevent entry of other diseases.

(3 x 1 = 3 mrks)

25 (a) Factors affecting digestibility of food in livestock
(i) Chemical composition of the feed e.g. % of lignin or cellulose will influence digestibility
(ii) The form in which the feed is offered to the animal e.g. crushed maize is more digestible than whole grain.
(iii) The species of the animal e.g. the digestibility of grass is higher in sleep than in Pigs.
(iv) The ratio of energy to protein will affect digestibility. The higher the ratio the lower the digestibility

(v) The quantity of feed already present in the digestive system of an animal.

(1mk for stating and 1mk for explanation. 4 x 2 = 8mks)

b)

(i) Healthy milking heard

- Should be free from milk-borne diseases such as brucellosis' and tuberculosis which is easily transmitted to man

(ii) Clean milking cows

- The flanks underline and the whole udder should be washed and dried thoroughly before milking

(iii) Healthy and clean milk –man

- A milker suffering from any contagious diseases should not be allowed to milk or handle milk

(iv) Clean milking shed

- Milking she or palour should be kept clean ,free from dust or odours

(v) Clean milking utensils

- The milking utencils and equipments should be seamless, smooth with joints filled to facilitate easy cleaning

(vi) Milk filtration /cooling and storage

- Milk should filtered and cooled down to $5C^0$ immediately after milking immediately after milking

(vii) Avoid flavours in milk

Bad flaours in milk are caused by foodstuffs and ovulation should be avoided before milking |(7 x1 = 7mks)

(c) Disadvantages of Natural method of mating

-High chances of in breeding or in breeding is not controlled.
-High chances of breeding disease transmission ie brucellosis or parasites such as trichonomas spp
-Males require extra pasture to feed on.
-Large males can injure small females.
-A lot of semen is wasted as single ejaculation produce semen that can serve several cows.
-It is cumbersome and expensive to transport a bull to hot areas to serve cows.

(5 x 1 = 5mrks)