NAME:	INDEX NO:
CANDIDATES SIGNATURE	
DATE	
SCHOOL	
233/1	
CHEMISTRY	
PAPER 1	
MARCH/APRIL 2010	
2 HOURS	
THE ELDODET EACT INTED COLOLL EV	VAMINATION 2010

THE ELDORET EAST INTER SCHOLL EXAMINATION-2010

Kenya CERTIFICATE OF Secondary Education.

FORM FOUR

233/1

BIOLOGY

PAPER 1

MARCH/APRIL 2010

2 HOURS

INSTRUCTIONS TO CANDIDATES;

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

Sign and write the date of examination in the spaces provided above

Answer All the questions in the spaces provided in the question paper.

All working Must BE clearly shown where necessary

Mathematical tables and electronic calculators may be used

Question	Maximum Score	Candidates Score
1-31	80	

1. The diagram below is a laboratory set up for preparation of oxygen gas.				
lack				
(a) Name				
	(43.67)			
(i) The apparatus marled A	(1MK)			
(ii) Solid P	(1mk)			
(b) Write an equation for the reaction that takes place in the flask.	(1mk)			
2. When magnesium is burnt in air, it react with both nitrogen and oxygen	. Write the formulae			
of the two products formed	(2mks).			
or the two products formed	(2111115).			
	•••••			
3. An element X forms an ion with the formula X+. The electronic of the ion	on is 2.8.			
(i)Name the chemical family of element X	(1MK)			
ii) .Write a chemical equation for the reaction of element \boldsymbol{X} in cold water.	(1mk).			
iii. State and explain the effect of the resulting solution in(ii) above on litn	nus paper(1mk)			

i)Name electrode A	(1/2)
i.Write the half equation in electrode B when the switch is closed	(1mk)
ii) .Explain why heating is necessary in the set up.	(1mk)
5. Chlorine reacts with ethane as shown below	
C2H6(g0 + Cl C2H5CL(g) +HCL(g)	
a) What condition is necessary for this reaction to occur	(1/2mk)
	(1/2)
b) Name the type of reaction that occurs	(1/2)

7. Alkaline earth metals get progressively more reactive down the group while halogens get progressively less reactive down the group. Explain (2mks)			
8. (a) An element P has atomic number17. It forms compound with element G. Using dots(.) crosses(x) to represent electrons. Draw a diagram to show the bonding in the compound. (2mks).	and		
(b) Molecular compounds have lower melting points compared to ionic compounds. Expalin why this is so.			
9. The scheme below shows some reaction sequence starting with solid N.			

(a) Identify solid N.

(b) Write the formula of the complex ion in solution R.	(1MK)
c).Give an importance of hard water	(1mk)
10. Dry carbon (II) gas react with lead(II)oxide as shown in the equ	ation
(a)Name the process undergone by lead (II) oxide (1mk)	
(b) Give a reason for your answer in (a) above (1mk)	
c) Name any other gas that can be used to perform the same function above reaction.	
11. Using the equation below, identify the substance that cats as a a	
Substance:	(1mk)
Reason:	(1mk)
12 a).Nitrogen(IV) Oxide is one source of environmental pollution.	

- 13. Give two main source of nitrogen (IV) oxide in the atmosphere (1mk)
- 14.A student was given four carbonates labeled A,B,C and d to heat and test for carbon(IV) OXIDE GAS. He obtained the following results.

Carbonates	Color before Colour after heating		Test for carbon (IV)	
	heating	(hot)	Oxide	
A	White	White	Negative	
В	White	Yellow	Positive	
С	Green	Black	Positive	
D	White	Red	Positive	

Which carbonate can be used to soften water? Explain your answer (2mks)
15.a)Study the equation below and answer the questions that follow $I_{2(s)}$ $I_{2(g)}$
9.(i) What conditions must be present for the changes represented by the equation above to occur (1mk)
ii.) Name the process represented by the equation above (1mk)
b.) How can the purity of a substance be determined (1mk)
16. An atomic of element Q can be expressed as 31/15Q. The letter dose not represent the actual symbol of the element.

a.) Write down the symbol of the most stable ion of element Q.

b).Write down the electronic arrangement of the ion element Q.				
17. Zinc metal was reacted with dilute hydrochloric acid as shown in the figure below. Study it				
and answer the question that follows.				
a.) Name gas N				
b). How can one tell if all acid has reacted?(1mk)				
c) Write down a balanced ionic equation to show the reaction taking place in the boiling tube.(1mk)				
18.1.47kg of CaCL was heated to a constant mass of 1.11G.Find the value of x.				
Ca=40, Cl=35.5, H=1, O=16 (3MKS.)				

- 19.(a.)Distinguish between the mass number and the relative atomic mass of an element.
- c.) Why is the atomic radius of magnesium larger that it's ionic radius.

When a green solid M was heated strongly in a test, a black residue and a gas which formed a while precipitate with lime water were formed.

a).Identify solid M	(1MK)

- b) .Write down a balanced chemical equation to show the reaction between the balck residues and dilute sulphuric acid (1mk)
- 20. State and explain why magnesium continues to burn is SO2 gas.(2mks).
- 21. Excess chlorine was bubbles into hot concentrated sodium hydroxide
- a.) Write equation of reaction above.(1mk)
- B). Calculate the oxidation number of chlorine in the chlorine formed (1mk)
- 22. Bottles of sodium carbonate, sodium chloride and sugar have lost their labels student prepares and tests an aques solution of a sample from each bottle. The results obtained are as shown in the table below.

Bottle	Ph	Electrical	Correct label
		conductivity	
1	7	CONDUCTS	
2	7	Dose not conduct	
3	10	Conduct	

Complete the table by filling correct label for each bottle.

23. Bleaching powder is used to treat water in drinking water supply plants. Briefly explain
how it eradicates the micro-organisms from water.(2mks)

24. What would you observe when the following tests are carried out in Iron (II) Sulphate
Solution.
i.) little aqueous ammonia is added to iron (II) sulphate solution.(1mk)
ii.) A few drops of concentrated nitric acid are added to Iron (II) Sulphate solution and warmed
gently.(1mk).
iii) Excess aqueous ammonia is added drop wise to the mixture in (II) above(1mk)
25. State two uses of Ammonia (2mks).
26. Starting from powered sulphur, describe how you would prepare a sample rhombic
sulphur.(3mks).
27. The diagram below shows an experiment to compare the heating effects of luminous and
non-luminous flame.

- a) .State and explain the observation made at the bottom of each beaker at the end of the experiment.(1mk)
- b.) The diagram below represents a luminous flame.

On the diagram, mark and label the hottest and coolest parts of the flame.(1mk0

- c) .When not in use, it is advisable to put off a non-luminous flame or turn it to a luminous falme.Expalin.(1mk)
- a.) Name any two water pollutants (1mk)
- d.)Describe the chemical test for water.(2mks)28.The molar masses of gases Y and Z are 28.0 and 44.0 Respectively. If a volume of 280cm3 of gas Y diffuses through a membrane in 70 seconds, how long will it take 400cm3 of gas Z to diffuse through the same membrane.(3mks)
- 29. The table below contains some information about the properties of oxides. Use the information in the table below to answer the questions that follow. Letters A, B, C, D, E& Z are not actual symbols of the elements.
- a.) The melting pointy of oxide of B is higher than that of the oxide of A. Why? (1mk)
- i.) Write the formula of the chloride of B. (1mk).
- ii.)State one possible use of calcium oxide (1mk)
- 30.(a) What is absolute Zero Temperature? (1mk)
- (b.)A gas occupies a volume of 600cm3 pressure of 760mmHg and a Temperature of x. C, at pressure of 780mmHg and Temperature of 50 C, The gas occupies a volume of 633.66cm3. Determine the value of x.

NAME:	INDEX NO):			
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233/2					
CHEMISTRY					
PAPER 2					
MARCH/APRIL 2010					
2 HOURS					
THE ELDORET EAST INTI	ER SCHOLL EXAMINATIO	N-2010			
Kenya CERTIFICATE OF S	econdary Education.				
FORM FOUR					
233/2	233/2				
CHEMISTRY					
PAPER 2					
MARCH/APRIL 2010					
2 HOURS	2 HOURS				
INSTRUCTIONS TO CAND	JDATES:				
INSTRUCTIONS TO CAND	IDATES,				
□ Write your name and index number in the spaces provided above.					
□ Sign and write the date of examination in the spaces provided above					
☐ Answer All the questions in the spaces provided in the question paper.					
☐ All working Must BE clearly shown where necessary					
☐ Mathematical tables and	——————————————————————————————————————	uscu			
Question	Maximum Score	Candidate score			

Question	Maximum Score	Candidate score
1	12	
2	10	
3	06	
4	08	
5	11	
6	12	
7	12	
8	09	
Total	80	

1. The grids represent parts of the periodic table. Study it and answer	question that follow. The
letters do not represent the actual symbols of the elements.	
(a).(i).Write down the electron configuration of element N	(1/2MK)
ii).Using dots (.)Or crosse(x) to represent electronics, draw a diagram	showing the formation
of an ion of element N.	(1/2)mk -).
b.) What type of structure could the oxide of K have? Explain.	(2mks)
c.)How does the reactivity of R and Q Compare?	(2mks)
d.)1.2g of K reacted completely with 1110 cm3 of chlorine gas at s.t.p	(1 mole of gas occupies
22.4dm3).	
i.) Write a balanced equation for the reaction between K and chlorine.	(1mk)
ii.)Determine the relative atomic mass K.(3MKS)	
ii) .Explain the observation that would be made if a nitrate of K is hea	ted.(2mks).
2. The flow chart below shows the industrial preparation of sulphuric	(vi) acid. Study it and
answer the question the follow.	
lack	
a).i.)With the help of an equation, state one source of sulphur (iv) oxic	le.(11/2)
ii.)Name a suitable substance that can be used in the drier.(11/2)	

iii).In the catalytic converter, the temperature is adjusted to about 45.C without external heating.

Explain (1mk)

- iv.) Write an Equation for the process taking place in a absorption tower? (1mk)
- v) Why is it not advisable to use hard water in the diluter?(1mk)
- vi.) Name one solid waste produced in this process.
- b.) Nitric (V) acid and hydrogen chloride can be prepared in the laboratory by heating a nitrate and chloride respectively with concentrated sulphuric (VI) acid. What property of concentrated sulphuric (VI) acid makes it suitable for the preparation of nitric (v) ACID and hydrogen chloride. (1mk)
- c.)How does the bleaching affects of sulphur (VI) oxide gas band chlorine gas compare (2mks)
- 3. The equation below shows the molar enthalpies of combustion of carbon, hydrogen and molar of formation of methane.



a).(i.)Draw the energy cycle diagram and work out the enthalpy of combustion of methane. (3mks).

b.Given that the ,molar heat of combustion of butane is-2877KJ/Mol and that C=12,H=1,calacualte heat value in KJ/gram.

- i. Methane (CH4)(1mk)
- ii.Butane.(1mk)

ii.

4. Auqeous hydrochloric acid was reacted with sodium sulphite and a gas A evolv	ed when this	
gas was dried, mixed with oxygen and then passed over a catalyst B, maintained a	t 400.Can	
exothermic reaction occurred. The product was cooled by an ice-salt mixture and	colourless	
crystals were formed. When very low PH value resulted.		
a.) Identify	(2mks)	
A		
B		
C		
D		
b.)Write equations for the reactions which led to the formation of	(2mks)	
A		
В		
c) Suggest a suitable drying agent for gas A.		
(d.)State and explain what would happen to the yield of c if the temperature of the	e catalysts	
were raised to 600C. (1mk)		
(e.)Write an ionic equation for the reaction which would occur between solution I	D and Z and	
Zinc Metal. (1mk).		

From the results in b(i) and ii above, which one is the better fuel.(1mk)

f) Describe one chemical test which could be used to identify gas A.	. (1mk)
5. The flow below represents the main steps in the preparation of sodium.	n carbonate.
a.) Name the substance labeled.	(2mks)
A	
B	C
D	
B.Cold water is made to circulate around X. What does this suggest about	out the reaction between
A and brine(1/2mks)	
c.)What process takes place in chamber Y.?	(½ MK).

d.)Name two by-products that are recycled in this process. e.)Why is recycling important?	(1MK) (1mk)
f.) Write the equation for the reaction that takes place in the upper part of solva	ny Tower(1MK)
g.)Assuming that there was no recycling in this process, two moles of ammonia required for producing one mole of an hydrous sodium carbonate. Calculate the ammonia at s.t.p that would be used to produce 10.6 kg of sodium carbonate by operating at 80% efficiency. (C=12,O=16.H=1,Na=23,N=14,I mole of gas occupies 22.4 dm3 at s.t.p)	a would be e volume of y a factory (3mks)
h.) Give two industrial uses of sodium carbonate	(2mks)

6.(a) Study the information in the table below and answer the question that follow.

Number of carbon atoms	Relative molecular mass of hydrocarbon
2	28
3	42
4	56

i.) Write the general formula of the hydrocarbons in the table	(1mk).
ii.) Predict the Relative Molecular Mass (RMM) of the hydrocarbor	
(1mk)	
ii.) Determine the molecular formula of the hydrocarbon in(ii) above formula (C=12,H=1) (2mks)	
b.) The scheme below shows some reactions of substances. Study it that follows.	and answer the question
I.Name the reagent used in	
Step 2:	(1mk)
Step 3:	(1mk)
Step 4:	(1mk)
ii.) Write an equation for the complete combustion of ethyne	(1mk)

iii.) Write down the name and structural formula of compound B. (2MKS)	
Structural formula	
Name	
iv) Give the homologous series that the compound formed in step 3 and step 2belong to.(1)	nk)
	• • • • •
v.) Explain what you understand by the term hydrocarbon.(1mk)	
v.) Explain what you understand by the term hydrocarbon (Thin)	
7. The scheme below shows various reactions starting with hydrogen and nitrogen gases. S	tudy
it and answer the questions that follow.	
lack	
a. Name the major source of	
i.) Hydrogen (1/2mk)	
1.) Hydrogen (HZIIIK)	
ii).Nitrogen (1/2mk)	
(=·=y	

b.Name the catalysts and explain why its used in step 1.							(1mk)		
								•	
c.)Identify									
i)Solid L							(1	IMK)	
								••	
ii).Gas J							(1	lmk)	
								•	
iii.) Process Q							(1	lmk)	
1) (2))]									
d.) (i.)Name compo	ound R ar	nd state or	ne use				()	lmk).	
ii.Determines the p	ercentage	of nitros	en in con	nound R				•	
		or muog	cii iii coii	проина К	•		(°	3mks)	
(N=14, 0, H=1,0 O=16.0) (a) (i) Write two equations for the reaction in step 1									
(e) (.i.) Write two equations for the reaction in step 1. (2mks)							2111K3)		
		•••••	• • • • • • • • • • • •	• • • • • • • • • • • • •		•••••			
ii.) Using an equati								2mks)	
ii.) Ching un oquus	on enplu	in the oos	ci vacion i	iidae iii st	. Ср 11.		(2	2111115)	
8. The solubility of	ftwo salts	s D and E	are give	n in the fo	ollowing t	able In e	each case	solubility	
per 100g of water.	tivo saite	, D unu E	are give		,110 11 111 15 1		acii casc	soruomi	
Temperature(0c)	10	20	30	40	50	60	70	80	
Solubility of D	17	21	24	29	34	40	47	56	
Solubility E	35.8	36.0	36.2	36.8	36.8	37.3	37.6	38.0	
	55.6	50.0	30.2	50.0	50.0	57.5] 57.0] 50.0	

Using the data, plot solubility curves (solubility against Temperature) of D and E on the same					
axes on the graph paper below. Use your graph to answer the question that follows. (4mks)					
(a.) At what temperature are the solubilities of the two salts equal?	(1mk)				
(b.)Estimate the solubility of D at 0c.	. (1mk)				
	, ,				
(c.)A saturated solution of E in 50grams of water at 25 was evaporated to dryr	ness .What was				
the mass of the residue	(1mk).				
d.)The saturated solution obtained was each cooled to 20 C.Calculate the total	mass of the salts				
precipitated. (2n	nks)				

NAME	.INDEX NO
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233/3	
CHEMISTRY	
PAPER 3	
MARCH/APRIL 2010	

THE ELDORET EAST INTERSCHOOLS EXAMINATION-2010 END OF TERM 1 2010 FORM FOUR Kenya certificate of secondary Education 233/3 CHEMISTRY PAPER 3 MARCH/APRIL 2010

Instructions to candidates

Write your name and index number in the spaces provided
Sign and write the date of examination in the spaces provided above
Answer all questions in the spaces provided in the question paper
You are NOT allowed to start working with the apparatus for the first 15 minutes of the
2 ^{1/4} hours allowed for this paper. This time is to enable you to read the question paper
and make sure you have all the chemicals and apparatus that you may need.
All working MUST be clearly shown where necessary.
Mathematical tables and electronic calculators may be used.

Question	Maximum score	Candidates score	
1	17		
2	15		
3	08		

 1.(a)You are provided with (b) Solution A 0.03 sodium hydroxide © Solution B 1m hydrochloric acid (d) Solid Q I gram of hydrated metal carbonate M2co³.x h2o You are required to determine □ The value of x M2co³.xH2o □ The volume of CO2(g) at room temperature and pressure 	
Procedure (i) Using a pipette and pipette filler place 25cm³ of solution B into a coadd all solid Q and wait for about four minutes until effervescence stop (ii) Transfer the resulting solution into a 250 ml volumetric flask using conical flask with a little distilled water and transfer the washing into t (iii) Add more distilled water to the solution in the volumetric flask to Shake the resulting solution well and label it C. (iv) Rinse the burette with solution C. Using a pipette and pipette fille solution A into a 250ml conical flask. Add 2 drops of solution A into a Add 2 drops of phenolphthalein indicator and titrate solution A with so results in the table 1 below. (v) Repeat the titration two more times to obtain two other readings and I II III Final burette reading (cm³)	os. g a funnel. Rinse the he volumetric flask. make up to the mark. r, place 25cm ³ of 250ml conical flask. plution C. Record your
Initial burette reading (cm³) Volume of solution C (cm³)	
(a)Calculate the(i) Average volume of solution C used	(1mk)
(ii) Moles of sodium hydroxide in 25.0cm ³ of solution A used	(1mk)
(iii) Moles of hydrochloric acid in the average volume of solution C us	sed (2mks)
(iv) Moles of hydrochloric acid in 25.0 cm ³ of solution C	(1mk)
(v) Moles of hydrochloric acid in the original 25cm ³ of solution B	(2mks)

(1mk)

(vii) Molar mass of solid Q hence the value of x given that the equation for the reaction between solution B and solid Q is

$$M_2co^3(s) + 2HCL_{(aq)} \rightarrow 2mcl_{(aq)} + H2o_{(l)} + Co_{2(g)}$$

(M=23.0, C=1.0, H=1.0, O=16)

(viii) Volume of CO2 (g) evolved at room temperature and pressure in the reaction in (vii) above. (Molar gas volume=24.0dm3)

2. Using the 50ml measuring cylinder provided, measure accurately 300cm³ of the 2M NaoH labeled solution P. transfer this solution into a clean 100ml plastic breaker. Fill the burette with solution R which is dilute hydrochloric acid. Use the thermometer provided to determine the steady temperature of solution P in the plastic breaker (do not remove the thermometer from the solution) Add exactly 5 cm³ of solution R from the burette into the beaker and stir gently using the thermometer. Read the highest temperature reached. Repeat adding 5cm³ of solution R after every 30 seconds up to 180 seconds and note the highest temperature reached after the addition.

Record your results in the table (II) below

Time (seconds)	0	30	60	90	120	150	
Volume of solution P	30	30	30	30	30	30	
Volume of solution R							
Total volume (cm ³)							
Temperature (°C)							·

(a) Plot a graph of temperature °c against volu (Let temperature be on y-axis)	ume of dilute hydrochloric acid (solution R)
b) From the graph, determine(i) The highest temperature reached	(1mk)
(ii) The volume of solution R which complete (1mk)	ely neutralized 30cm ³ of 2MNaOH (solution P)
c) How many moles of dilute hydrochloric ac (2mks)	id completely neutralized 30cm3 of 2MNaOH
hydrochloric acid	ction hence the molar heat of neutralization of be 4.2 kj/kg/k and the density of the solution to (3mks)
3. You have been provided with solid K to ca (a) Place a spatula end full of solid K in a cleastrongly. Test any gas using blue and red litm	an dry test tube. Heat the solid gently and then
Observations	Inference

(b) To the residue obtained in (a) above, add about $1\mathrm{cm}^3$ of $2\mathrm{M}$ HCL and shake well. Divide the solution into two equal portions	
Observations	Inference
(1/2 MI _c)	(1/2mlr)
(1/2 Mk)	(1/2mk)
a) To the first neution odd 2M NeOU dneu wige watil in every	
c) To the first portion add 2M NaOH drop wise until in excess	
Observations	Inference
(1mk)	(1mk)
(d) To the second portion, add 2M Ammonium hydroxide solution drop wise till in excess Observation Inference	
(1 1)	(1 1)
(1mk)	(1mk)