CHEMISTRYR FOUR 4

NDARAGWA GIRLS SECONDARY

KCSE REVISION QUESTINS 2017

1. a) The table below shows some elements of the periodic table and their atomic numbers (The letters do not represent the actual symbol of the element. Study it and answer the questions that follow

Element	A	B	C	D	E	F	G	H	I	J
Atomic number	1	7	8	19	15	2	9	6	16	20
Electronic configuration										

i) Complete the table by filling the electronic configuration for each element (5mks)

ii) Which letter represents:

I. The most powerful reducing agent. Explain (1mk)

II.The most powerful oxidizing agent. Explain (1mk)

iii) Select two elements with oxidation state of -2 (1mk)

iv) Which element has the highest first ionization energy? Explain (1mk)

v) Select two elements which when reacted form a compound that conducts electricity both in molten and aqueous state (1mk)

vi) Which two elements when reacted form a compound that dissolves in water to form an acidic solution (1mk)

vii)Using dots and crosses to represent electrons, show the bonding in a compound formed when A combines with B (2mks)

2.a) The formulae below represent active ingredient of two cleansing agents A and B
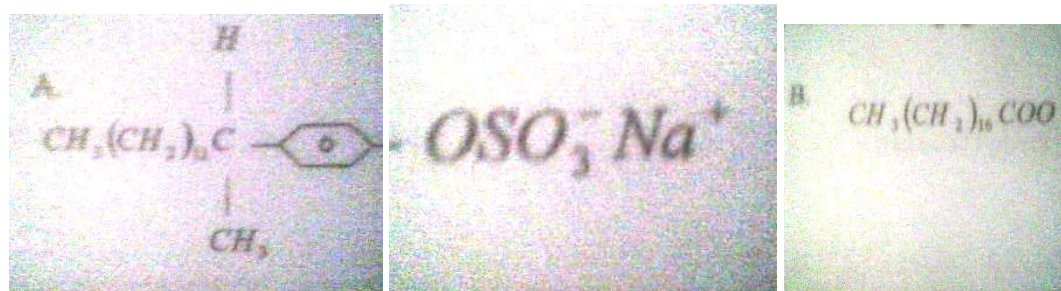
Which one of the cleansing agents would be least suitable for washing in water containing magnesium hydrogen carbonate? Explain (2mks)

e)Dacron is a synthetic fibre formed by polymerization reaction between a dicarboxylic acid and a diol (a polyhydric alkanol)

HOOC - C_6H_4 - COOH $HO(CH_2)_2OH$
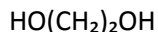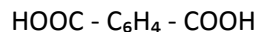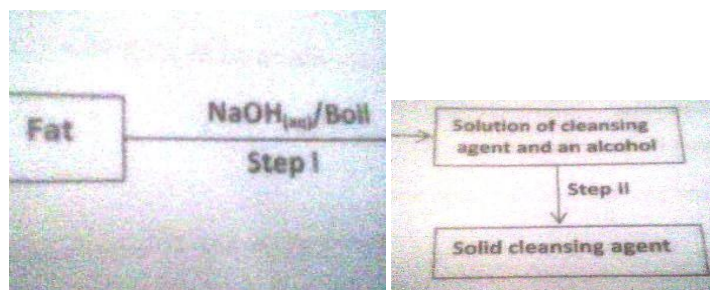
Dicarboxlic acid   Ethanel -1,2 –diol

i)Show how polymerization between the two occurs (1mks)

ii)Name the type of polymerization involved in forming Dacron (1mk)

iii)Give one advantage of synthetic fibre over natural fibres (1mk)

b)The scheme below was used to prepare a cleansing agent. Study it and the questions that follow

i)What name is given to the type of cleansing agent prepared by the method above (1mk)

ii)Name one chemical substance added in step II (1mk)

iii)What is the purpose of adding the chemical named in b (ii) above (1mk)

iv)Name any other suitable substance that can be used in Step I (1mk)

v)Explain how an aqueous solution of the cleansing agent removes oil during washing (2mks)

3. a) A current of 0.5A was passed for 15 minutes through a solution of sulphuric VI acid using platinum electrodes. Find the volume of oxygen in cm^3 liberated at a pressure of 1 atmosphere and temperature of 25°c (Faraday's constant 96500 Coulombs, molar gas volume at s.t.p is 22400 cc) (3mks)

b) A cell is constructed between copper and silver. Standard electrode potential for the two metals are given below

Ag (aq)/Ag (s); E^o=+0.80v

Cu^{2+} (aq)/Cu (s); E^o= +0.34v
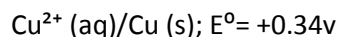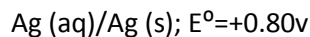
i) Name the cathode and the anode (2mks)

Anode………………….

Cathodes………………..

4. When 50cm³ 1M Potassium hydroxide was reacted with 50cm³ of 1M hydrochloric acid, the temperature rose by 8⁰c.When the same volume of Potassium hydroxide was reacted with 50cm³ of 1M Pentanoic acid, the temperature rose by 3⁰c

i)Give reasons for the above difference in temperature (2mks)

ii)Write an equation to show dissociation of pentanoic acid (1mk)

iii)Draw the structural formula of ethanoic and propanoic acid (1mk)

iv)Give the name and formula of the organic compound formed when ethanol and propanoic acid react in presence of concentrated sulphuric acid (1mk)

5. a)The table below shows the relationship between the volume of a fixed mass of a gas and its temperature (⁰c) at constant pressure

Volume (cm³)	30	32	34	37	39	41	43
Temperature (⁰c)	0	20	40	60	80	100	120
Temperature (K)							

i)Complete the table by filling the corresponding temperature in kelvin (3 ½ mks)

ii)Plot a graph of volume (cm³) on the vertical axis against temperature in Celsius on the Horizontal axis using a temperature range : -300⁰c to 120⁰c (3mks)

iii)Extrapolate the graph in (ii) above to cut the Horizontal axis and read the temperature value (1mk)

iv)Determine from the graph, the volume of the gas when the temperature is -225⁰c (1mk)

b)A balloon contains 100cm³ of air at 25⁰c.The balloon was put outside in the sun where the temperature was 40⁰c.Calculate the new volume of air.(2 ½ mks)

6.One mole of butane gas was mixed with excess chlorine gas in a gas jar at room temperature and kept in dark conditions. On observation, no reaction occurred in the dark conditions. On exposure to light the chlorine gas was decolorized

i)State the importance of light in the above reaction (1mk)

ii)Write an equation for the reaction that occurs once the mixture is exposed to light (1mk)

iii)Name the organic product formed in the above reaction (1mk)

7.a)During the preparation of Copper (II) sulphate excess Copper (II) oxide is used. Explain (2mks)

b)When lead nitrate and magnesium sulphate react, a white precipitate is formed

i)Identify the white precipitate (½ mk)

ii)Write an ionic equation for the reaction (1mk)

b)When anhydrous calcium chloride is exposed to the atmosphere it forms a solution

$CaCl_2(s) \text{--} H_2O \rightarrow CaCl_2(aq)$
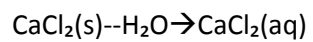
i)Name the process that takes place (½ mk)

ii) State one use of the process displayed by anhydrous calcium chloride (1mk)