231/1 CHEMISTRY (2018)
KCSE *Trial Exam*
MARKING SCHEME

1   a) Fermentation

  b) i) H_2O

  ii) NH_4^+

2.   a)-Colorless

  -Odorless

  b) High affinity for hemoglobin/combines with hemoglobin

  -Forming carbooxyhaemoglobin which stops oxygen transport by blood/red blood cells.

3.   a) Concentrated hydrochloric acid

  b) To absorb fumes of hydrogen chloride gas.

  c) i) downward delivery//upward displacement of air

  ii) Denser that air

4. –Deliquescent substance is a substance that absorbs water vapour or moisture from the environment and dissolves to form a solution.

 -Efflorescent is a substance that gives out its water of crystallization to the environment.

5.

	C	H	O
%	69.42	4.13	26.45
Moles	$\frac{69.42}{12}$	$\frac{4.13}{1}$	$\frac{26.45}{16}$
	=5.785	4.13	1.653
Ratio	5.785/1.653=3.5	4.13/1.653=2.5	1.653/1.653=1
Whole No	3.5x2=7	2.5x2=5	1x2=2
Empirical	$C_7H_5O_2$		

6.
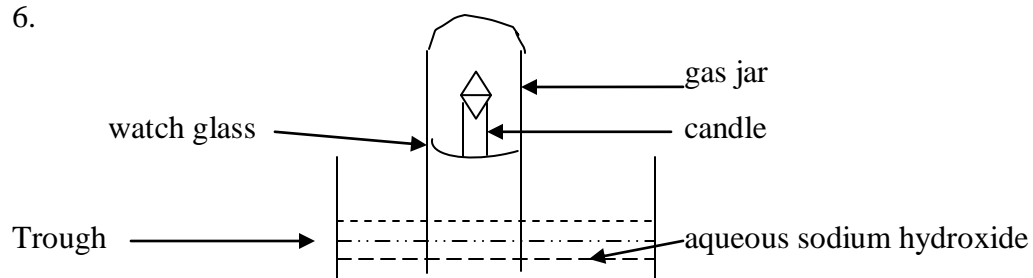
7. –Oxygen gas is made up of molecules with weaker van der waals forces of attraction which requires less energy.

 -Sodium metal is made up of atoms with delocalized electrons having stronger metallic bonding which requires more energy to break.

8.

BOTTLE	CORRECT LABEL
1	NaCl
2	Sugar
3	Na_2CO_3

9. a) Ionic

   b) C –Reacts by receiving one electron in the outermost energy level. Less energy is required//more protons in the nucleus stronger attraction.

10 a) X, P

   b) A

11.a) Under similar conditions of temperature and pressure the rate of diffusion of a gas is immensely proportional to the square root of its density.

b) $R_P/R_a = \sqrt{88/32}$
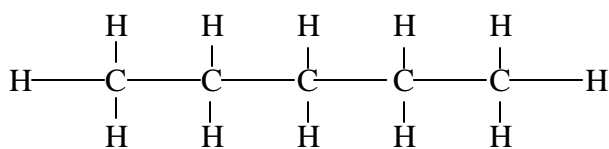
       $12/R_Q = \sqrt{44/16}$

       $R_Q = 7.24 cm^3/s$

12. Poison from the nettle plant is acidic, the ammonia solution neutralize the acid
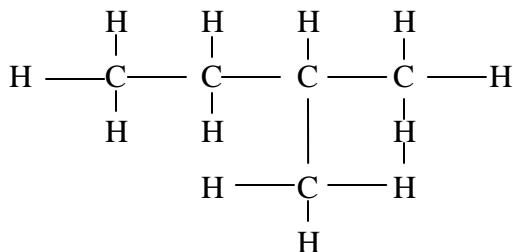
13. i) Increase rate of reaction

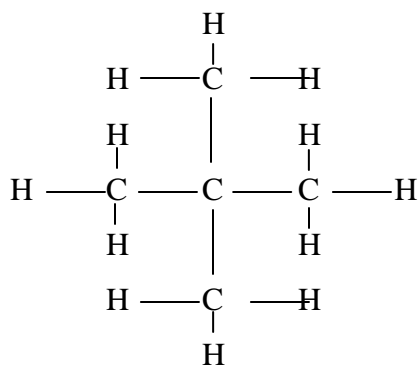   ii) Equilibrium shifts towards the endothermic reaction

14.

Normal pentane

2-methyl butane

2, 2-dimethyl propane

15. Empirical formula mass $1x2+2x1+1x16=30$

$$30n=180$$

$$n=6$$

16.

Symbol	protons	configuration	No of Neutrons
Al		2.8.3	
F$^-$	9		
Be^{2+}		2	

17. a) copper-increase in mass

-copper reacts with oxygen in the air to form copper (ii) oxide

b) Copper (ii) nitrate –Decrease in mass

-copper nitrate decomposes to form copper (ii) 0xide and nitrogen (IV) oxide which escapes into the atmosphere.

18. Atomic No = 31-16

         =15

  Electronic configuration for ion = 2.8.8.

19. a) Charles Law-The volume of a fixed mass of a gas is directly proportional to its absolute temperature provided pressure is kept constant.

  b) $\dfrac{P_1V_1}{T_1} = \dfrac{P_2V_2}{T_2}$ $\dfrac{5 \times 400}{500} = \dfrac{0.25 \times 100}{T_2}$ $T_2 = \dfrac{0.25 \times 100 \times 500}{5 \times 500}$ $=6.25K$

20 RMF (KOH) =39 +16+1 =56

  Moles 11.2 =0.2

21. Measure fixed volume of $Al_2(SO_4)$ into a beaker ($50cm^3$)

  -Add 2m NaOH/KOH solution a drop at a time until Precipitation stops.

-Filter the mixture $A(SO_4)$ Remain as residue
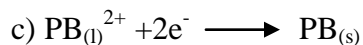
-Wash several times with distilled water

Dry the residue in the air or gentle heating

22   a) sulphuric acid   b) Effervesce stops   c) Green

23.   a) molten lead(ii) bromide has free ions that conduct electricity

         b) A► Anode   Cathode (on the diagram)

         c) $PB_{(l)}^{2+} +2e^- \longrightarrow PB_{(s)}$

24. i) –Diamond   -Graphite
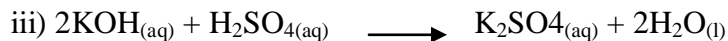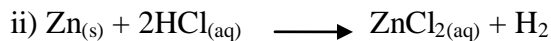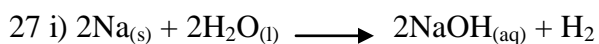
  ii) The existence of a substance in more than one form in the same physical state.

25. a) K   b) i) G   ii) I

26. Sublimation-physical

Neutralization- Chemical

Fractional Distillation-physical

27 i) $2Na_{(s)} + 2H_2O_{(l)} \longrightarrow 2NaOH_{(aq)} + H_2$

  ii) $Zn_{(s)} + 2HCl_{(aq)} \longrightarrow ZnCl_{2(aq)} + H_2$

  iii) $2KOH_{(aq)} + H_2SO_{4(aq)} \longrightarrow K_2SO4_{(aq)} + 2H_2O_{(l)}$

28.   -Workability (1)

         -method of collection (½)

         -Reagents (½)

         -Drying Agent (½)

         -Neatness   (½)