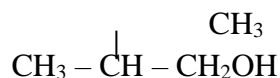


- The chemical symbol of potassium is represented as ${}_{19}^{39}\text{K}$. The mass number of this element is
 - 19
 - 20
 - 39
 - 58
- The following elements have allotropic forms except,
 - Sulphur
 - Sodium
 - Carbon
 - silicon
- The symbol of the element gold is.....
 - Ag
 - Na
 - Au
 - Go
- Which one of the following substances is a mixture?
 - Air
 - Glucose
 - Water
 - Salt
- Electrolysis is the..... by passing electricity through it.
 - Dissolving of a compound
 - Decomposition of a solid
 - Decomposition of a solution of a compound
 - Melting of a compound
- The factors below affect the rate of chemical reaction except,
 - Temperature
 - Concentration of a reactant
 - Sunlight
 - Colour of reactant
- Ammonium nitrate is a fertilizer. Its chemical formula is
 - NH_3NO_3
 - NH_4NO_2
 - NH_4N
 - NH_4NH_3
- Ionic or electrovalent compounds have the following properties except,
 - They have low melting point
 - Their solution can conduct electricity
 - They have high melting point
 - They do not dissolve in oil or methyl benzene
- In the nuclear reaction, ${}^A_Z\text{M} \longrightarrow {}^A_{z+1}\text{Y}$, the particle emitted is
 - Alpha

- B. Beta
C. Neutron
D. Gamma
10. Which one of the following carbonate decomposes when heated strongly?
A. CaCO_3
B. Na_2CO_3
C. Li_2CO_3
D. K_2CO_3
11. An unknown solution X has a PH = 14, X is most likely to be,
A. Sodium chloride
B. Hydrochloric acid
C. Potassium hydroxide
D. Carbonic acid
12. Which one of the following gases cannot be dried by concentrated sulphuric acid?
A. Cl_2
B. HCl
C. NH_3
D. SO_2
13. What are the values of X and Y in the equation?
 $\text{C}_3\text{H}_8 + \text{XO}_2 \longrightarrow \text{YCO}_2 + 4\text{H}_2\text{O}$
A. 8 and 3
B. 5 and 3
C. 3 and 4
D. 3 and 5
14. Which one of the following gases changes lime water milky?
A. Cl_2
B. CO_2
C. SO_3
D. H_2S
15. A current intensity of 10 amperes was passed for 5 minutes through a molten solution of calcium bromide. The mass of calcium deposited at the cathode is.
A. $\frac{40 \times 10 \times 5 \times 60}{96500 \times 2}$
B. $\frac{40 \times 10 \times 5}{96500 \times 2}$
C. $\frac{40 \times 10 \times 60}{96500 \times 1}$
D. $\frac{10 \times 5 \times 2}{96500 \times 40}$
16. Which one of the following compounds decolourises bromine water?
A. C_4H_{10}
B. C_3H_6
C. C_5H_{12}
D. C_2H_6
17. During the extraction of aluminum, cryolite is added to the fused oxide of aluminum in order to,
A. Raise its melting point

- B. Increase the rate of the reaction
 C. Lower the melting point
 D. Lower the concentration of the aluminum
18. The name of the organic compound shown below is,



- A. Methyl propan – 2 – ol
 B. 2, Methyl propan – 2 – ol
 C. 2, Methyl propan – 2 – ol
 D. Propan – 2 – ol
19. Calculate the mass of potassium carbonate in 0.25moles.
- A. 34.5g
 B. 3.45g
 C. 4.35g
 D. 0.345g
20. During the fermentation of glucose solution, the enzyme used is and the gas produced is
- A.Zymase, carbon monoxide
 B.Zymase, oxygen
 C.Maltose, alcohol
 D.Zymase, carbon dioxide

21. The figure below shows part of the periodic table. The position of the unknown elements W, X, Y, Z, U, V, T are indicated. The letters are not the real symbols of the elements. Use it to answer the questions that follow.

w	1							2
		X				U		
	T			Y		V		Z

- a) Write the letters of two elements which belong to the same group or period.
- i. Group. Period:
- ii. Which element is a noble gas?

.....

- iii. Write the electron arrangement of the element Y.

- iv. Write the chemical formula of compound formed between T and V.

- v. Write letters of two elements which exist as diatomic molecules.

 (3marks)

b) i). What is a homologous series?

.....

 (1mark)

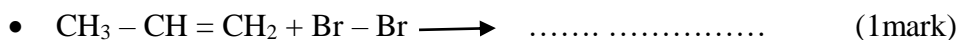
ii). Write the general formula for the following homologous series;-

- Alkyne. (½mark)
- Alkanols. (½mark)

iii). Write the names of the following organic compounds;-

- $\text{H}_2\text{C}=\text{CHCl}$
 (1mark)
- $\text{CH}_3 - \text{CO}_2\text{H}$.
 (1mark)

iv). Complete the following reaction mechanism.

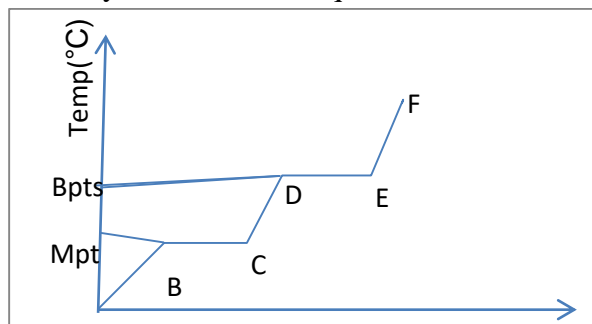


SECTION B (70MARKS)

1. a) What is the difference between permanent change and non – permanent change

Permanent change	Non – Permanent change

b). the heating curve of a pure solid is shown in the graph below. Study it carefully and answer the questions below.



i. What is the physical state of the solid in region (1 mark)

➤ B – C

.....

➤ C – D

.....

ii. Explain why the temperature remains constant in the regions B – C and D – E despite continues heating.

.....

(2marks)

2. a). Write the name of the following compounds and radicals;-

i. Na_2SO_4

ii. $\text{Fe}(\text{OH})_3$

iii. NH_4

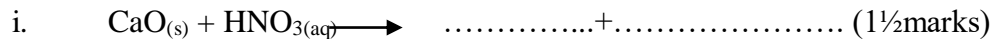
iv. LiH (2marks)

b). Complete the table below, its about the types of salts. Classify these salts and write their parent acid.

(2marks)

Chemical formula of salt	NaCl	$\text{Mg}(\text{HCO}_3)_2$	K_2PO_4
Type of salt			Normal
Parent acid	HCl		

c) Complete and balance the following equations;-



3. a). Define the following terms;-

i. Electrolyte.

.....
.....
.....
.....
..... (1mark)

ii. Electrode potential.

.....
.....
.....
..... (1mark)

b). The electrode potential of three elements are stated below.

$\text{Cu}|\text{Cu}^{2+} = 0.34\text{Volts}$, $\text{Ag}|\text{Ag}^+ = +0.79\text{Volts}$ and $\text{Mg}|\text{Mg}^{2+} = - 2.38\text{Volts}$.

i. Arrange these elements in order of decreasing standard electrode potential [Begin with the highest potential].

.....
.....
.....
..... (2marks)

ii. Calculate the electromotive force of electric cell designed from silver and magnesium as electrodes.

.....
.....
.....
.....
.....
.....
.....
.....
..... (3marks)

4. a) Chlorine is both an oxidizing agent and bleaching agent. What is meant by the terms;-

i. Oxidizing agent.

.....

- (1mark)
- ii. Bleaching agent.

 (1mark)
- iii. Chlorine bleaches a blue dye by oxidizing the dye. Give two chemical equations to illustrate the bleaching action of chlorine.

 (1mark)

b). Give the chemical equations to show the reactions of chlorine with:-

- i. Heated iron.

 (1mark)
- ii. Hot concentrated potassium hydroxide.

 (1mark)

c). State four uses of chlorine gas.

.....

 (2marks)

5. a) What is meant by the following terms:-

- i. Molar solution.

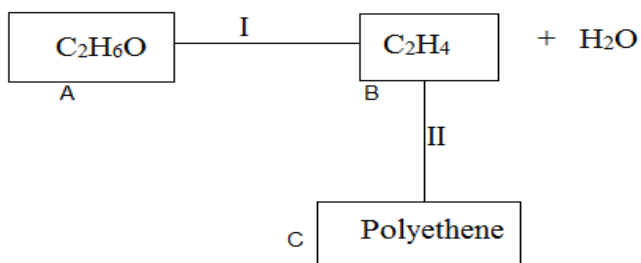
 (1mark)
- ii. Standard solution.

 (1mark)
- iii. Indicator.

 (1mark)

.....
..... (1mark)

c). Study the reaction scheme below and answer the questions that follow.



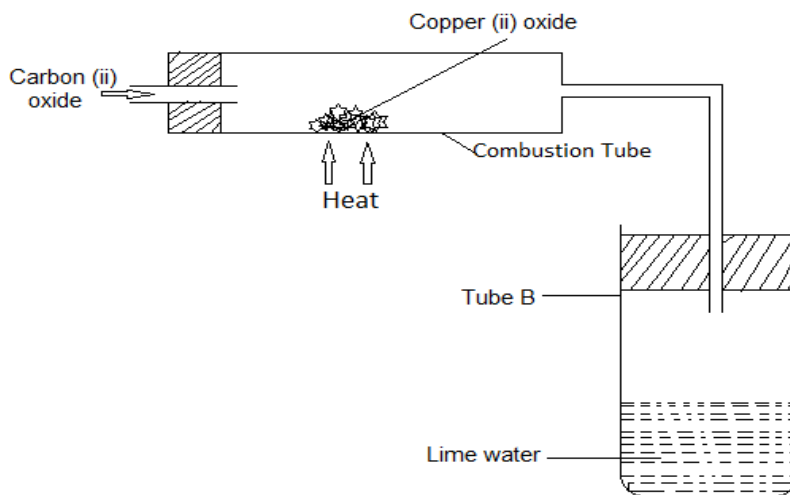
i. Write the structural formula of the compounds (1mark)

A.
.....
B.
.....

ii. Write the two conditions required for the reaction I to occur.

.....
.....
..... (1mark)

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



i. Write the chemical equation which occurs inside the combustion tube after sometimes.

.....
.....
..... (1mark)

ii. Give the observations occurring inside the combustion tube.

.....
.....
..... (1mark)

iii. Write the chemical equations occurring in tube B above after ;-

- Short time.

.....
.....
..... (1mark)

- Long time.

.....
.....
..... (1mark)

b). Define the following terms;-\\

i. Radioactivity.

.....
.....
..... (1mark)

ii. Half life.

.....
.....
..... (1mark)

c). 16g of radioisotope X decayed for 24 minutes and the mass that remained was 2g. Find the half life ($t_{1/2}$) of X.

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
..... (2marks)

8. a) State three factors that affect the rate of chemical reaction.

.....
.....
..... (1½marks)

b). Ammonia is manufactured industrially by the Haber process. The reaction equation is $3\text{H}_{2(g)} + \text{N}_{2(g)} \rightleftharpoons 2\text{NH}_{3(g)}$ $\Delta H = -92\text{KJ/mol}$.

i. State the three conditions which will increase the yield of ammonia.

.....
.....
..... (1½marks)

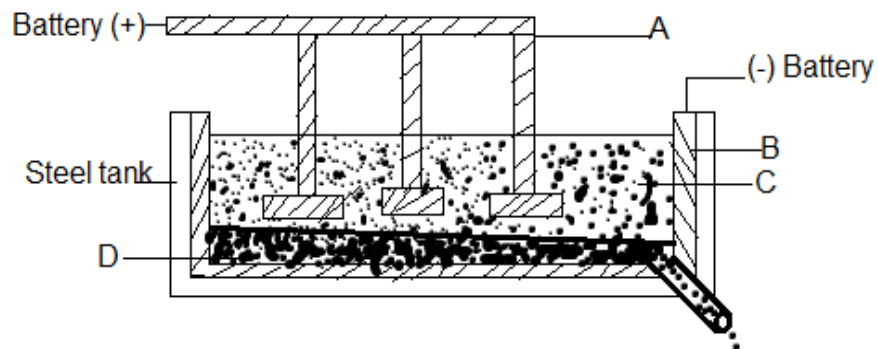
ii. Explain why less ammonia is produced if the temperature is raised.

.....
.....
.....
.....
..... (2marks)

c). State Le Charteliers' principle.

.....
.....
.....
..... (2marks)

9. Aluminum metal is extracted from its ore by the electrolysis using the Hall's cell, see the diagram. Study this diagram then answer the questions that follow.



i. Name the parts labeled;- (2marks)

A.
B.
C.
D.

ii. Why is it necessary to heat the ore to form a molten solution?

.....
.....

- (1mark)
- (1mark)
- iii. Write the ionic equation which occur at the;-
- Cathode.
.....
..... (½mark)
 - Anode.
.....
..... (½mark)
- iv. Explain why the anode should be replaced from time to time during the extraction process.
.....
..... (½mark)
- v. Write two uses of aluminum metal.
.....
.....
..... (1mark)

b).(i) What is iron rust?
.....
..... (1mark)

ii. State two methods which are used to prevent rusting of iron.
.....
..... (1mark)

10. a) What is meant by;-
- i. Acid oxide.
.....
..... (1mark)
 - ii. Amphoteric oxide.
.....
..... (1mark)

b). classify the following oxides into basic, acidic, Amphoteric and neutral oxides

- i. Li_2O (½mark)

- ii. SO₂. (½mark)
- iii. H₂O. (½mark)
- iv. Cl₂O₇. (½mark)

c). Ammonia solution [NH₄OH] was added drop by drop into three test tubes containing three different cations. The following observation were detected

I Tube 1 produced a green precipitate

II Tube 2 produced blue precipitate

III Tube 3 produced white precipitate insoluble in excess

Write the chemical formula of the cations and the precipitate formed in each tube.

Test tube	Cations	Formula of precipitate
1		
2		
3		

*****THE END*****