

1. The following substances are mixtures except;-
  - A. Steel
  - B. Bronze
  - C. Air
  - D. Water
2. The process used to obtain pure water from sea water is known as
  - A. Filtration
  - B. Decantation
  - C. Distillation
  - D. Sedimentation
3. The formula of a compound Q is  $Y_3(PO_4)_2$ . What is the electronic configuration of an atom of Y?
  - A. 2:8:2
  - B. 2:8:8
  - C. 2:8:4
  - D. 2:8:5
4. The molarity of a solution containing 49g of sulphuric acid in  $250\text{cm}^3$  of the solution is.
  - A. 0.125M
  - B. 0.50M
  - C. 1.00M
  - D. 2.00M
5. Which one of the following metals displaces lead from lead (ii) nitrate solution?
  - A. Silver
  - B. Copper
  - C. Mercury
  - D. Zinc
6. During the extraction of sodium metal from sodium chloride ore, calcium chloride was added to the ore before it was melted in order to;-
  - A. Catalyze the reaction
  - B. Remove impurities from the ore
  - C. Lower the melting point of the ore
  - D. Increase the solubility of sodium in the ore
7. Which one of the following metals reacts slowly with cold water but rapidly with steam?
  - A. Calcium
  - B. Magnesium
  - C. Sodium
  - D. Lead
8. Which one of the following is true about bases?

- A. All bases are soluble in water
  - B. All bases are hydroxides
  - C. All bases neutralize acids
  - D. All bases are oxides
9. Which one of the following oxides is soluble in both dilute nitric acid and dilute sodium hydroxide solution?
- A. Copper (ii) oxide
  - B. Magnesium oxide
  - C. Calcium oxide
  - D. Zinc oxide
10. Which one of the following substances will not oxidize concentrated hydrochloric acid to chlorine gas?
- A. Potassium permanganate (VII)
  - B. Lead (II) oxide
  - C. Manganese (IV) oxide
  - D. Lead (IV) oxide
11. The main components of air are;-
- A. Oxygen and nitrogen
  - B. Neon and hydrogen
  - C. Carbon dioxide and argon
  - D. Nitrogen and helium
12. Which one of the following compounds is a hydrocarbon?
- A.  $\text{CH}_3\text{CH}_2\text{OH}$
  - B.  $\text{CH}_3\text{CH}_3$
  - C.  $\text{CH}_3\text{Cl}$
  - D.  $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$
13. Which one of the following elements is added to natural rubber during vulcanization?
- A. Silicon
  - B. Phosphorous
  - C. Sulphur
  - D. Iodine
14. Which one of the following compounds does not cause hardness of water?
- A. Calcium hydrogen carbonate
  - B. Calcium sulphate
  - C. Magnesium sulphate
  - D. Sodium carbonate
15. Which one of the following cations does not dissolve in excess sodium hydroxide solution?

- A.  $\text{Al}^{3+}$   
 B.  $\text{Pb}^{2+}$   
 C.  $\text{Zn}^{2+}$   
 D.  $\text{Fe}^{3+}$
16. The following statements are true about sulphur dioxide gas except,  
 A. It turns blue litmus red  
 B. Its an oxidizing agent  
 C. Its an reducing agent  
 D. It decolourises potassium manganate (VII)
17. Which one of the following reagents can be used to distinguish between ethene and ethane?  
 A. Bromine water  
 B. Lime water  
 C. Potassium dichromate  
 D. Barium nitrate
18. The process in which ethene forms solid whose molecular mass is more than 10,000 is called  
 A. Polymerization  
 B. Hydrogenation  
 C. Vulcanization  
 D. Cracking
19. The chemical name of rust is known as  
 A. Hydrated iron (iii) oxide  
 B. Anhydrous iron (iii) oxide  
 C. Affected iron (iii) oxide  
 D. None of the above
20. When one mole of ammonium chloride was dissolved in a certain volume of water, 2.94KJ of heat was absorbed. The amount of heat absorbed when 5.35g of ammonium chloride is dissolved in the same volume of water is [ $\text{NH}_4\text{Cl} = 53.5$ ]
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| <p>A. <math>\frac{53.5}{2.94 \times 5.35}</math></p> | <p>C. <math>\frac{29.4 \times 53.5}{5.35}</math></p> |
| <p>B. <math>\frac{2.94 \times 5.35}{53.5}</math></p> | <p>D. <math>\frac{53.5 \times 5.35}{2.94}</math></p> |
21. a) Carbon dioxide gas was passed through a saturated solution of calcium hydroxide until when there was no further change.

i. State what was observed.  
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ii. Write the equation(s) of reaction(s) that took place.  
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b). Burning magnesium was lowered in a gas jar of carbon dioxide gas.

i. State what was observed.  
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ii. Write the equation of reaction that took place.  
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iii. Give any two uses of carbon dioxide gas you know.  
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**SECTION B (70MARKS)**

1. a) Chlorine gas was prepared in the laboratory from concentrated hydrochloric acid and substance X in at room temperature.

i. Identify substance X.

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ii. Write the equation of reaction leading to the formation of chlorine gas from substance X.

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b). Chlorine gas was bubbled through a solution of sodium bromide.

i. State what happened to the solution.

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..... (1mark)

ii. Write the equation for the reaction that took place.

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..... (2marks)

c). Name any two uses of chlorine gas you know.

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..... (2marks)

2. a)(i) Differentiate between diffusion and effusion.

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..... (2marks)

ii). State Graham's law of diffusion.

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..... (1mark)

iii). Under similar conditions,  $150\text{cm}^3$  of nitrogen gas diffuses at 21 seconds while  $150\text{cm}^3$  of an unknown gas W diffuses at 63 seconds. Calculate the molar mass of

W.

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3. a) Ethene is prepared in the laboratory from ethanol and sulphuric acid.

i. State the conditions needed for the production of ethene.

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ii. Write the equation leading to the formation of ethene.

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iii. Write the structural formula of ethene gas.

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b). Ethene reacts with chlorine to form 1,2,dichloro ethane.

i. State the condition for the reaction to occur.

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ii. Write the equation for the reaction that took place.

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..... (2marks)

4. An organic compound W contains 52.2% carbon, 13.0% hydrogen and the rest being oxygen. Given that the vapour pressure of the W is 23,

a. Calculate the empirical formula of W.

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b. Determine the molecular formula of W.

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c. Draw the structural formula of compound W.

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5. a) An element M has electronic configuration of 2:8:8:2.

i. State the group and the period to which M belongs.

Group: .....

Period: ..... (2marks)

ii. Draw the electronic structure of the ion of M.

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b). Element M was put in a warm water and left for few minutes.

i. State what was observed.

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ii. Write the equation of the reaction that took place.

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6. a)(i) Define the term electrolyte.

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ii Draw a labeled diagram of apparatus that can be used to electro – plate iron with zinc.

b). During electrolysis of copper (ii) sulphate solution using copper electrodes, 0.45 amperes of current was passed for 40 minutes. Calculate the mass of the product formed at the cathode.

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7. a) An atom of an element is represented as  ${}_{15}^{31}X$ .



- i. Calculate its neutron number.  
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 ..... (2marks)
- ii. Write the electronic configuration of the an ion of X.  
 .....  
 ..... (1mark)
- iii. Name the number of electrons in an atom of X.  
 .....  
 ..... (1mark)

b). X reacts with chlorine when heated. Write the equation of the reaction between chlorine and element X.  
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 ..... (3marks)

8. a) What is a standard solution?  
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 ..... (1mark)

b). 25cm<sup>3</sup> of 0.1M sodium hydrogen carbonate solution reacted completely with 27.8cm<sup>3</sup> of sulphuric acid.

i. Write the equation of reaction that took place.  
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 ..... (1mark)

ii. Calculate the number of moles of sulphuric acid that reacted.  
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 ..... (3marks)

iii. Calculate the concentration of sulphuric acid in moles per litre.

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9. Explain the following observations and write equations where necessary;-

a) Solid copper (ii) sulphate does not conduct electricity whereas molten copper (ii) sulphate does.

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b) The resultant solution of ammonium sulphate turns blue litmus solution red.

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10. Glucose,  $C_6H_{12}O_6$  can be converted to ethanol by a catalytic reaction caused by an enzyme produced from yeast.

a) Name the;-

i. Reaction in which yeast convert glucose to ethanol.

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ii. Enzyme produced by yeast during reaction.

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..... (1mark)

iii. Write the equation of reaction leads to the formation of ethanol.

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b)(i) What is polymerization?

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ii. Name the two types of polymerization you know.

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..... (2marks)

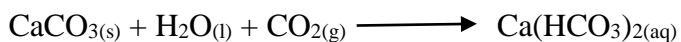
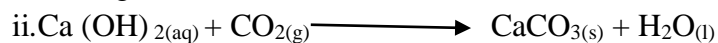
\*\*\*\*\*THE END\*\*\*\*\*

## MODULE ANSWERS TO SET ONE CHEMISTRY

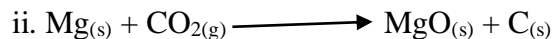
### SECTION A (30MARKS)

- |      |       |       |       |
|------|-------|-------|-------|
| 1. D | 6. C  | 11. A | 16. B |
| 2. C | 7. B  | 12. B | 17. A |
| 3. A | 8. C  | 13. C | 18. A |
| 4. D | 9. D  | 14. D | 19. A |
| 5. D | 10. B | 15. D | 20. B |

21. a)(i) A milky substance formed turned to a colourless solution in excess carbon dioxide gas.



b. (i) the magnesium continues burning for a short time and stops forming a white ash and black specks of carbon.



(iii.) It's used in fire extinguisher

It's used in the manufacturing of carbonated drinks

It's used as refrigerating agent

### SECTION B (70MARKS)