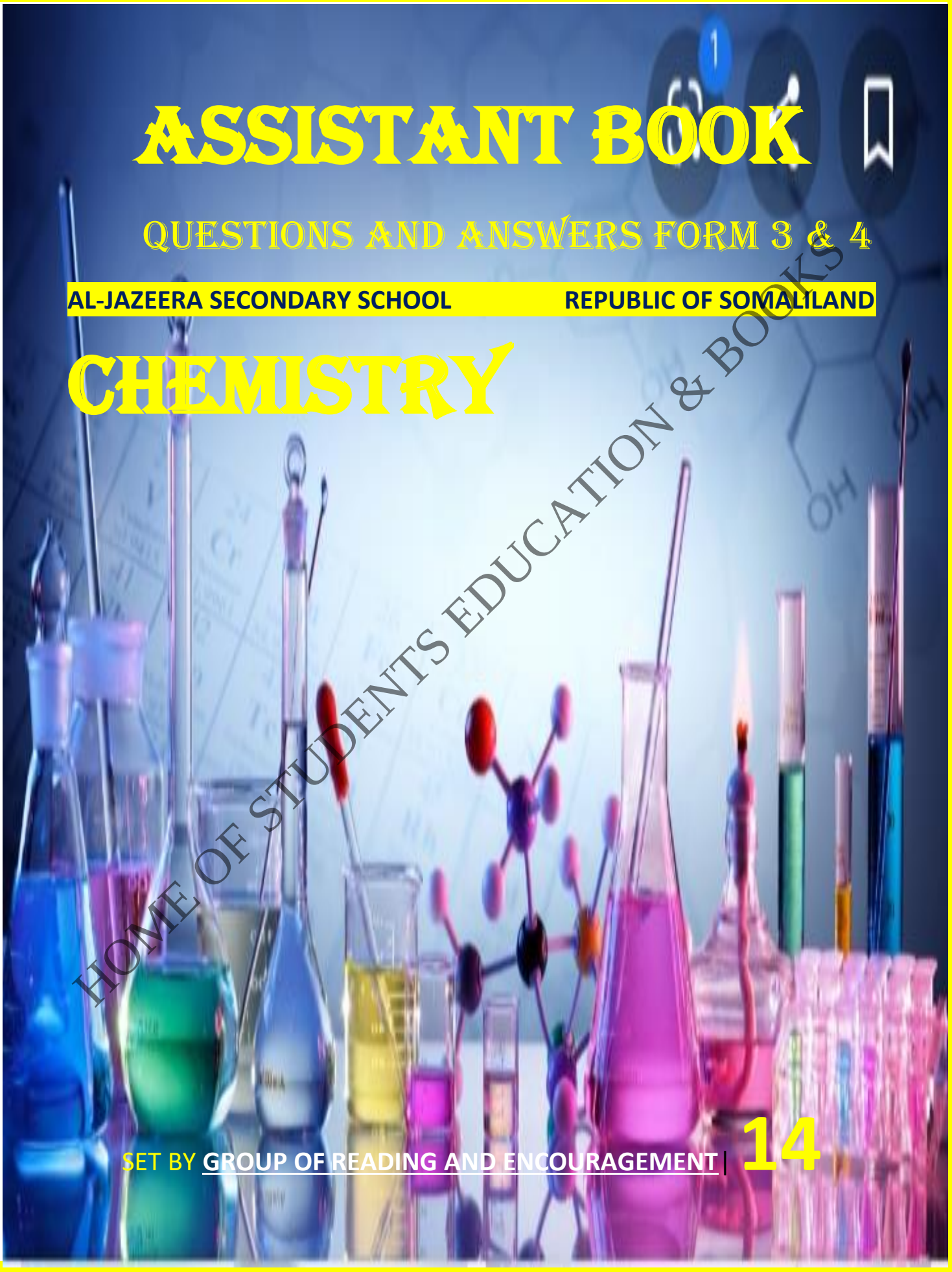


ASSISTANT BOOK

QUESTIONS AND ANSWERS FORM 3 & 4

AL-JAZEERA SECONDARY SCHOOL **REPUBLIC OF SOMALILAND**

CHEMISTRY

HOME OF STUDENTS EDUCATION & BOOKS

SET BY GROUP OF READING AND ENCOURAGEMENT | 14

ACKNOWLEDGEMENT

First of all thanks to Allah for allowing us to complete this booklet with questions and answers in Form 3 and 4 in high school.

*Next up is a special thanks to the owner of **Al-Jazeera Secondary School**, **Mr Khadar haji Yusuf**, and the school's management and esteemed teachers for their excellent efforts to prepare students for this booklet, which is a great complement to every student. Who hopes to pass the exam successfully.*

*I also commend the remarkable efforts of the students who worked on the writing of this book, which has been internationally researched and committed to the completion of this book, first by **Zakariye Ahmed Aden** and several other students who participated in the same study. editing this booklet.*

INTRODUCTION

When we saw the importance of having students find a book of questions and answers that would facilitate and help them read, understand, and distribute the content, especially in Form 3 and 4 in high school, they were written everywhere. possible questions.

DISCLAIMER

We are excusing the time spent in the classroom and avoiding a year of unsuccessful readings in the 4th or final year of high school not to review much of the chapters containing books, but to the extent that we suspect. We had to go back and reassure them.

We are human beings and never miss mistakes in human writings. While we can make the effort we have done little, yet we know that we will never be wrong.

AL-JAZEERA SECONDARY SCHOOL
HOME OF STUDENTS EDUCATION & BOOKS

PROVIDE

While the textbook is not our own and is a product of our curriculum, we have dedicated this book to every student in high school, especially Form 3 and 4.

We hope they will benefit from it.

REFERENCE OF THIS BOOK

WhatsApp # +252634791140 or +252633010484

TABLE CONTENTS

CHAPTER ONE	ACID, BASE AND SALT	PAGE	3
CHAPTER TWO	METELS	PAGE	1O
CHAPTER THREE	ELECTROLYSIS	PAGE	14
CHAPTER FOUR	NON- METELS	PAGE	19
CHAPTER FIVE	RATE OF REACTION	PAGE	28
CHAPTER SIX	ATOMIC STURUCTURE AND PERIODICITY	PAGE	31
CHAPTER SEVEN	MOLE AND STATIOMETRY	PAGE	40
CHAPTER EIGHT	BONDING AND STURUCTURES	PAGE	44
CHAPTER NINE	ORGANIC CHEMESTRY	PAGE	48
CHAPTER TEN	THERMO-CHEMESTERY (ENTHALPY CHANGE)		57

HOME OF STUDENTS EDUCATION & BOOKS

QUESTIONS AND ANSWERS ABOUT ACIDS BASES AND SALTS

1. *What is the acid?*
   - ❖ *Is a substance in which when dissolved in water they produce hydrogen ion*
2. ***What are the physical properties of acids?***
   - ❖ *ANS.*
     - *They contain hydrogen ions*
     - *They have sour taste*
     - *They have PH less than 7*
     - *Strong acids are corrosive*
     - *They act as an electrolyte*
     - *They react whit bases*
     - *They turn blue litmus paper into red*
3. ***Write all classifications of acids?***
     - ***Their source***
       - ***A.*** *organic acid*
       - ***B.*** ***in*** *organic acid*
     - ***Their hydrogen ion***
       1. *strong acid*
       2. *weak acid*
     - ***Their concentration***
       1. *concentrated acid*
       2. *dilute acid*
4. ***Write common acids?***
   - ❖ *Ans.*
     - ***Sulphuric acid***
     - ***Nitric acid***
     - ***Hydro chloric acid***

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

5. *How to preparation acid?*

Ans.

- *ACID ANHYDRIDE + WATER = ACID*
- *NON-METAL + HYDROGEN = ACID*

6. WHAT IS THE WEAK ACID?

ANS. DISSOCIATION SLIGHTLY IN WATER

7. WHAT IS THE NORMAL PH?

ANS. THE NORMAL PH IS 7

8. WHAT IS THE BASE?

ANS. ARE IONIC COMPOUND THAT BREAK DOWN IN WATER PRODUCE HYDROXIDE IONS (OH).

9. WHAT IS THE PROPERTY OF BASE?

- *THEY HAVE BITTER TASTE.*
- *THEY HAVE PH GREATER THEN 7*
- *THEY CONTAIN HYDROXIDE IONS (OH).*

10. STATE EXAMPLES OF BASE?

ANS.

- *SODIUM OXIDE*
- *CALCIUM OXIDE*
- *POTASSIUM HYDROXIDE*

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

❖ *AMMONIUM HYDROXIDE*

11. WHAT IS THE ALKALI?

ANS. SOLUBLE BASE IS CALLED ALKALI.

12. WHAT IS THE CHEMICAL PROPERTIES OF ALKALI?

ANS.

- ✓ *THEY NEUTRALISE ACID TO FORM SALT AND WATER*
- ✓ *BASES REACT WITH CARBON DIOXIDE TO FORM CAR BON MONOXIDE*
- ✓ *THEY REACT WITH METALS TO PRODUCE HYDROGEN GAS*

13. TELL THE SOME USES COMMON BASES?

ANS.

- ❖ *NAOH= IS USED IN THE MANUFACTURE OF SOAP.*
- ❖ *AL(OH)= IS USED AS MEDICINE FOR GASTRIC PATIENTS*

14. WHAT IS THE INDICATOR?

ANS. IS A CHEMICAL SUBSTANCE CHANGES THEIR COLOUR WHEN ADDED TO ACIDS IT BASES

15. WHAT THE ACID BASE REACTION?

ANS.

- ✓ *ACID +METAL_____>SALT + HYDROGEN*
- ✓ *ACID + METAL OXIDE_____> SALT +WATER*
- ✓ *ACID + ALKALI _____> SALT +WATER*

AL-JAZEERA SECONDARY SCHOOL
HOME OF STUDENTS EDUCATION & BOOKS

- ✓ *ACID + CARBONATE _____> SALT + WATER + CARBON DIOXIDE*
- ✓ *ACID +METAL HYDROGEN CARBONATE ___>SALT + WATER +CARBON DIOXIDE*

16. ACID WITH METAL?

ANS. A REACTIVE METAL PRODUCES SALT AND HYDROGEN THIS IS THE DISPLACEMENT CHEMICAL REACTION.

17. ACID WITH IN SOLUBLE BASE?

ANS. ACID ARE REACT WITH IN SOLUBLE AND SOLUBLE BASE TO FORM SALT AND WATER THIS IS A NEUTRALIZATION REACTION

18. ACID WITH ALKALI?

ANS. THEY NEUTRALISE ACID TO FORM SALT AND WATER

19. WHAT IS THE NEUTRALIZATION REACTION?

ANS. IS A CHEMICAL REACTION IN WHICH THE ACIDITY AND ALKALINITY OF THE SUBSTANCE.

20. WHAT MEANS THE DESTROYING ACIDITY?

ANS. MEANS REMOVING HYDROGEN IONS FROM THE ACID BY THE REACTION WITH BASE.

21. WHAT MEANS THE DESTROYING ALKALINITY?

ANS. MEANS REMOVING HYDROXIDE IONS FROM THE ALKALIS THE REACTION WITH ACID

22. WHAT ARE USES OF NEUTRALIZATION REACTION?

ANS.

- ✓ *SOIL TREATMENT FARMING.*

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

- ✓ *INDIGESTION*
- ✓ *INSECT STINGS*
- ✓ *WASTE FROM FACTORIES*

23. WHAT IS THE SALT ?

ANS. SALT ARE COMPOUND FORMED BY THE PARTIAL OR COMPLETE NEUTRALIZATION OF ACID BY BASE.

24. WHAT ARE THE TYPES OF SALT?

ANS.

I. NEUTRAL SALT:- IS THE SALT WHICH IS OBTAINED AFTER THE REACTION BETWEEN WEAK BASE AND WEAK ACID.

II. ACID SALT:- IS THE SALT WHICH OBTAINED FROM AFTER THE REACTION BETWEEN STRONG ACID AND WEAK BASE

III. BASIC SALT:- IS A SALT WHICH OBTAINED FROM THE REACTION BETWEEN THE STRONG BASE AND WEAK ACID

25. TELL THE CLASSIFICATION OF NORMAL SALT?

ANS.. NORMAL SALT CAN BE CLASSIFIED INTO TWO SOLUBLE BASE INSOLUBLE BASE.

26. TELL THE PROPERTIES OF SALT?

ANS.

- ➢ *METHOD 1:- METALS AND ACID*

  FOR EXAMPLE ZINC REACT WITH DILUTE SULPHURIC ACID AND DISPLACES HYDROGEN ION FROM THE ACID TO PRODUCE ZINC SULPHATE AND HYDROGEN GAS.

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

- *METHOD 2:- ACID WITH INSOLUBLE BASE.*

  COPPER WILL NOT REACT WITH DILUTE SULPHURIC ACID BUT COPPER(LL) OXIDE NEUTRALIZES WITH A DILUTE SULPHURIC ACID TO GIVE COPPER SULPHATE AND WATER.

- *METHOD 3:- ACID WITH ALKALIS*

  SOLUBLE BASE IS CALLED ALKALI THESE NEUTRAL WITH ACID TO GIVE SALT AND WATER

- *METHOD 4:- ACID WITH CARBONATE*

  METAL CARBONATES AND METAL HYDROGEN CARBONATE ALSO NEUTRALIZES DILUTE ACID TO PRODUCE SALT , WATER AND CARBON DIOXIDE

- *METHOD 5:- DIRECT COMBINATION OF METALS WITH HALOGEN.*

  WHEN METALS REACT WITH HALOGEN , FORM COMPOUND CALLED SALT.

27. WHAT IS THE PREPARATION OF INSOLUBLE SALT?

ANS. .IN SOLUBLE SALT CAN BE PREPARED BY PRECIPITATION TWO SOLUBLE SALT ARE MIXED TOGETHER TO GIVE AN INSOLUBLE SALT.

28. .WHAT ARE THE PH- SCALE?

ANS.

PH-SCALE IS THE MEASUREMENT OF THE ACID OR ALKALINITY OF SOLUTION. IT PROVIDES A VALUE FROM 0 TO 14 WHERE 7 IS NEUTRAL, LESS THAN 7 IS ACIDIC AND GREATER THAN 7 IS ALKALI OR BASIC.

PH -CALCULATIONS

PH= -LOG[H^+] *[H^-]= 10^{-PH}*

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

$POH = -LOG[OH^-]$ $[OH^-]=10^{-POH}$

EXAMPLES:- CALCULATE THE PH THE FOLLOWING SOLUTIONS

A) 0.004 $[H^+]$

SOLUTION:

$PH = -LOG[H^+]$

$= -LOG\ (0.004)$

$= -LOG\ [4\times10^{-3}]$

$= -LOG\ 4+LOG10^{-3}$

$= -\ LOG\ 4-3(1)$

$= -(LOG\ 4-3)$

$= -LOG4+3$

$= -0.6+3$

$= 2.4$ ACIDIC SOLUTION

CALCULATE THE POH SOLUTION:-

$POH = 1\times10^{-8}$

SOLUTION:-

$POH = -LOG[OH^-]$

$= -LOG\ (1\times10^{-8})$

$= -(LOG1-8\ LOG\ 10)$

$=-(LOG1-8)$

$= -0+8$

AL-JAZEERA SECONDARY SCHOOL
HOME OF STUDENTS EDUCATION & BOOKS

= 8

29. Types of Nomenclature of Acid?

1. *WHEN THE ACID DOES NOT CONTAIN OXYGEN THE ACID IS CALLED BINARY ACID*

2. *WHEN THE ACID CONTAINS OXYGEN THE ACID IS CALLED OXY ACID..*

Question and answers about METALS

1. *What is the metal?*
   - ✓ *Is an element that readily forms positive ions and has metallic bond*
2. *State physical properties of metals?*
   - ❖ *They are shiny*
   - ❖ *They are strong*
   - ❖ *They are ductile*
   - ❖ *They are malleable*
   - ❖ *They are sonorous*
   - ❖ *They are good conductors of electricity and heat*
   - ❖ *They have melting point and boiling point*
   - ❖ *They have high density*
3. *List chemical properties of metals?*
   - ❖ *They react with oxygen to form metal oxide*
   - ❖ *They react with water to form metal hydroxide and hydrogen*
   - ❖ *They react with acid to form salts and hydrogen*
4. *What does reactive mean?*
   - ✓ *Means a more Reactive metals has strong drive to form a compound*
5. *What is the reactivity series?*
   - ✓ *Is a list of metals elements, arranged in order of their reactivity*
6. *What is the electrochemical series?*

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

✓ *Means radily loss electron*

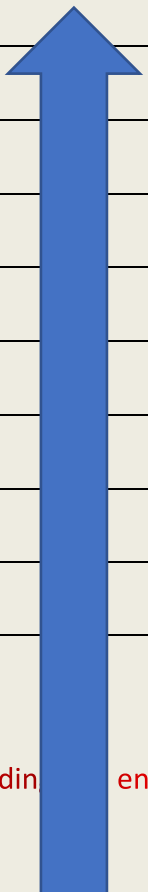
7. *List some of metals?*

Metals	*Symbol*	*Metal*	*Symbol*
Aluminum	*Al*	*Cobalt*	*Co*
calcium	*Ca*	*Nickel*	*Ni*
Copper	*Cu*	*Mercury*	*Hg*
Gold	*Au*	*Platinum*	*Pt*
Iron	*Fe*	*Chromium*	*Cr*
Lead	*Pb*	*Scandium*	*Sc*
Magnesium	*Mg*	*Beryllium*	*Be*
Potassium	*K*	*Strontium*	*Sr*

AL-JAZEERA SECONDARY SCHOOL

8. *List the metals in order their reactivity?*

Potassium	*K*	*Most reactive*
Sodium	*Na*	
Calcium	*Ca*	
Magnesium	*Mg*	
Aluminum	*Al*	
Zinc	*Zn*	
Carbon	*C*	
Iron	*Fe*	
Lead	*Pb*	
Hydrogen	*H*	



HOME OF STUDENTS EDUCATION & BOOKS

Copper	*Cu*	
Silver	*Ag*	
Gold	*Au*	*Least reactive*

8. *Define and differentiate extraction of alloy and ore?*
   - ✓ *Alloy is a mixture of two or more metals*
   - ✓ *Ore is a rock compound that contain metals*
9. *State the methods of extraction of metals from their ore?*
   - ❖ *Electrolysis*
   - ❖ *Reduction*
   - ❖ *Roasting in air*

10. *What are the types of extractions metals from their ores?*

   - ❖ *Mining*
   - ❖ *Extraction*
   - ❖ *purification*

10.State five alloy and their uses?

Alloy	*Uses*
Cupronickel	*Silver coins*
Stainless steel	*Car parts, kicken sinks and etc.*
Brass	*Musical instruments*
Manganese	*Springs*
Solder	*Joining wires and pipes*

11.State the ores of aluminium, iron and copper?

Metal	*Ores*
Aluminum	*Bauxite*
Iron	*Hematite*

AL-JAZEERA SECONDARY SCHOOL
HOME OF STUDENTS EDUCATION & BOOKS

Copper	*copper pyrite*

12. What are the different b\w corrosion and rusting?

- ✓ *Corrosion found in all metals*
- ✓ *Rusting found in iron and steel*

13. State the conditions of rusting?

- ❖ *Water*
- ❖ *oxygen*

14. What is the displacement reaction?

- ✓ *Is the process by which more reactive metals displace less reactive metals*

15. What is the aluminium?

- ✓ *Is the most abundant metal on the earth*

16. How aluminium extract from their ore?

- ❖ *By electrolysis*

17. Uses of aluminium?

Is used to make

- ❖ *Beer cans*
- ❖ *Cooking foil*
- ❖ *Racing bikes*
- ❖ *TV aerials*
- ❖ *Aeroplanes and ships*

18. What is the iron?

- ✓ *Is the second most abundant metal in the earth crust*

19. How iron extract from their ore?

- ❖ *By heating with carbon or carbon monoxide {reduction} in blast furnace*

20. List raw materials of extraction iron?

- ❖ *Iron ore*
- ❖ *Limestone*
- ❖ *Coke*

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

- *Hot air*

21. Uses of iron?

- *Buildings*
- *Transportation*
- *Tools*

22. Define rusting?

- *Is the most common form of corrosion but its confined to iron and steel*

23. Tell factors that prevent rusting?

- *Painting*
- *Oiling greasing*
- *Coating with plastic*
- *Electroplating*

24. How copper extract from their ore?

- *Roasting in air*

25. List uses of copper?

- *for electrical wires*
- *Making alloys*
- *Making cooking tools*
- *Making boilers and condensers*

AL-JAZEERA SECONDARY SCHOOL
HOME OF STUDENTS EDUCATION & BOOKS

Questions and answers about ELECTROLYSIS

1. Differentiate oxidation and reduction?

Ans. ***Oxidation:-***

- ***Is loss of electron***
- ***Is loss of hydrogen***
- ***Is gain of oxygen***

Reduction:-

- ***Is gain of electron***
- ***Is gain of hydrogen***
- ***Is loss of oxygen***

2. *What is the redox reaction?*

Ans. is the reaction between oxidation and reduction

3.what is the oxidizing agent ?

Ans. - is a substance which transfer oxygen to another substance and removes hydrogen from that substance

- oxidation agent is electron Acceptor

4. What is the reducing agent?

Ans. - is a substance which transfer hydrogen to another substance and removes oxygen from that substance

-reducing agent is electron donor

5. Explain oxidation number?

Ans. is the apparent charge that an element has in a compound or ion

- oxidation numbers are important in tracking electron movement in redox reaction

- oxidation number also called oxidation states

6. What is the ***Electrolysis?***

Ans. is *the process of substance decomposed caused by electricity*

- is the most powerful way to decompose ionic compound

- is a break down caused by electricity

7. What is the electrolyte?

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

Ans.is the substance that conduct electricity when in molten state or aqueous solution

- is a substance which is decomposed

- is carried the electrons by ions

8. What is the non- electrolyte?

Ans.- is the substance that do not conduct electricity when molten or solution state

9.what is the electrode?

Ans. are rods or wires that conduct electricity

10. What is the types of electrode?

Ans. are two :-

- ***Cathode:*** *is a negatively electrode*
- ***Anode : is*** *a positively electrode*

11. What is the Cautions and Anions?

Ans. - Cautions are positive ions; going to the cathode

- Anions are negative ions ; going to the Anode

12. What is the conductor and insulator?

Ans. - ***Conductor*** *is the substance that allow electricity to pass through them*

- ***insulator / non- conductor*** *is the substance that do not allow electricity to pass through them*

13. What are the solids that conduct electricity?

Ans. they are metals and graphite because they are free electrons

14.what are the liquids that conduct electricity?

AL-JAZEERA SECONDARY SCHOOL
HOME OF STUDENTS EDUCATION & BOOKS

Ans. any liquid that contains ions will conduct electricity because they are free ions

15. Why non-metals conduct electricity?

Ans. also all non -metals conduct electricity because they have free ions

16.what is the different between molten state and Aqueous solutions?

Ans.

- ***Molten state :*** *this compound do not contain water (* ***H+ & OH-)***
- ***Aqueous solution :*** *this compound contain water (* ***H+ & OH-)***

17. *List uses of electrolysis?*

Ans.

- *Electroplating*
- *Extraction of metals*
- *Purification of metals* ***e.g.*** *potassium, sodium, magnesium*
- *Anodizing of Aluminium*
- *Electrolysis of brine*
- *Manufacture of important compounds* ***e.g.*** *potassium, sodium hydroxide*
- *Manufacture of non -metals* ***e.g.*** *oxygen, hydrogen, chlorine etc.*

18. What is the electroplating?

Ans. is the process coat one metal with another metal or plastic with metal

19. What is the brine?

Ans. is a concentrated solution of sodium chloride or common salt

20. What are the products used for brine?

Ans. electrolysis of brine is very important process b/c products are so useful they are:-

- *Chlorine (a poisonous yellow-green gas)*

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

- *Sodium hydroxide solution ,(alkaline and corrosive)*
- *Hydrogen (a colourless flammable gas)*

21. What is the formula of calculation of electrolysis?

Ans. shortest formula is :- M= ITAR/2F

M= I×T×AR/ 2F

Where ***M = mass of the object***

I = current of electrolysis and its unit is Ampere (A)

T = time or how long it flows and its unit is second (S)

AR : relative molecular mass(molar mass) of the element

F : one mole of electron; 1Farady = 96,500 Coulombs

22. *What is the coulomb?*

Ans. is the unit to measure the quantity of electricity

1 coulomb = 1 amp × 1 second

23 . Tell another formula of T?

Ans. we can use this formula :-

t = M×F×Z / I × A

QUESTIONS AND ANSWERS ABOUT Non-Metals

Q1: *what are the non -metal and where they are periodic table?*

Ans. non- metals are elements in same atom and they are right hand side of periodic table

Q2: *what are the physical and chemical properties of non -metals?*

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

Ans. physical properties are

- *Non -metal are non -malleable*
- *Non -metal are bad conductors*
- *Non -metal may be solid liquid and gas*

Chemical properties are

1: all non -metal react metals with oxygen to form acidic oxide
2: non- metals react with chlorine to form covalent chlorides
3: non -metals react with hydrogen to form covalent hydrides

Q3: *list the lightest element?*

Ans. hydrogen is the lightest element because it can lose and gain one electron

Q4: *state the isotopes of hydrogen?*

Ans. they are

- *Protium*
- *Deuterium*
- *Tritium*

Q5: *how hydrogen prepared in laboratory?*

Ans. in the laboratory hydrogen gas is usually prepared by the reaction between zinc with dilute hydrochloric acid

- *Zn+Hcl = zncl2+H2*

Q6: *how hydrogen is prepared in industry?*

Ans. is prepared process called steam reforming

Q7: *what is the catalyst used preparation of hydrogen?*

Ans. used nickel catalyst

Q8: *what are the conditions of 800c 30 atmosphere pressure nickel catalyst*

AL-JAZEERA SECONDARY SCHOOL
HOME OF STUDENTS EDUCATION & BOOKS

Q9: *what are the physical properties of hydrogen?*

Ans. it's colourless odourless and taste less gas

It's non-poisonous and insoluble in water

It's lighter than air and it's the lightest of all gases

Q10: *what are the chemical properties of hydrogen?*

Ans. they are

- *Combustion*
- *Reaction with chlorine*
- *Reaction with nitrogen*
- *Reaction with metal oxides*

Q11: *how to test hydrogen?*

Ans. by using burring splint hydrogen burns with pop sound

Q12: *state uses of hydrogen?*

Ans. hydrogen is used manufacture of ammonia

Hydrogen is used as fuel in the future

Hydrogen is used manufacture of ethanol

Q13: *what is the most abandon of the air?*

Ans. nitrogen is all around it makes up 78% of the air

Q14: *how laboratory is prepared nitrogen?*

Ans. prepared by heating a mixture of ammonium chloride and sodium nitrite

Q1*5: state physical properties of nitrogen? :*

Ans. it's colourless and odourless

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

It's almost dense at atmospheric air

It's slightly soluble in water

Q16: *state the chemical properties of nitrogen?*

Ans. it reacts with hydrogen to form ammonia

Q17: *state the uses of nitrogen?*

Ans. they are

- *In the manufacture of ammonia*
- *In the manufacture of nitric acid and fertilizers*
- *To quick freeze food*
- *For food packaging*

Q18: *state the only alkaline gas?*

Ans. *ammonia*

Q19: *what are the process that prepared ammonia and catalyst?*

Ans. *Haber process; and used iron catalyst*

Q20: *state physical properties of ammonia?*

Ans. it's *colourless gas*

- *Non- poisonous in nature*
- *Its lighter than air*
- *It's highly soluble in water*

Q21: *state uses of ammonia?*

Ans. *it's used in manufacture of nitric acid*

It's used in the manufacture of dyes and house

Q22: how to test ammonia?

AL-JAZEERA SECONDARY SCHOOL
HOME OF STUDENTS EDUCATION & BOOKS

Ans. *the ammonia in basic in nature it with turns red litmus into blue*

Q23: *what are the raw materials of Nitric acid?*

Ans. *ammonia, air and water*

Q24: *what is the process prepared nitric acid and catalyst?*

Ans. *Ostwald process ; and used platinum catalyst*

Q25: define *fertilizers?*

Ans. *fertilizers are chemical substances added to the soil to increase the number of elements that has been replaced by plants*

Q26: *what are the types of fertilizers?*

Ans. they are

- *Organic fertilizers. : green plant or compost manure*
- *Chemical fertilizers: nitrogen, phosphorous, potassium (**NPK**)*

Q27: *state problems of fertilizer?*

Ans. *nitrates promote to growth of tiny water plant called algae some algae are poisonous to fish and human*

Excess nitrate in the river may get into drinking water increases the risk of blue baby syndrome

Q28: *explain oxygen and its compound?*

Ans. *oxygen is the element that keeps alive it's in group six and period 2 the periodic table*

Q29: *how oxygen is prepared in laboratory?*

Ans. *by catalytic Decomposition of hydrogen peroxide*

Q30: *which catalyst is used when prepared Oxygen?*

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

Ans. *Is used manganese oxide catalyst*

Q31: *how can prepare oxygen in industries?*

Ans. *prepared from the Decomposition of nitrates*

Q32: *state physical properties of oxygen?*

Ans. *they are*

- *It's a neutral to the indicator*
- *It's non- combustible gas but it's combustion supporter*
- *It's Adour less taste less gas*

Q33: *state chemical properties of oxygen?*

Ans. *they are*

- *Oxygen react with metals*
- *Oxygen react with non- metal*
- *Oxygen react with organic compound*

Q34: *what is the rusting?*

Ans. *rusting is the reaction of iron or steel with oxygen in the presence of moisture*

Q35: *what are the uses of oxygen?*

Ans. *they are*

- *It's used by plant and animals for respiration*
- *It's used as bleaching agent for the manufacture of popper*
- *It's used by mountain climbers and astronauts*

Q36: *how to test the oxygen?*

Ans. *Re-lights glowing splint*

Q37: *what are the oxides?*

AL-JAZEERA SECONDARY SCHOOL
HOME OF STUDENTS EDUCATION & BOOKS

Ans. *These are compounds formed when oxygen react with other element*

Q38: *what are the types of oxides?*

Ans. *They are*

1: ***acidic oxides:*** *oxides form when non-metals react with oxygen*

2: ***basic oxides:*** *oxides form when metals react with oxygen*

3: ***amphoteric oxides:*** *oxides that act as acids bases*

*4****: per oxides:*** *oxides that contain more oxygen*

5: ***neutral oxides:*** *some oxides are either acid or base*

Q39: *explain sulphur and its compound?*

Ans. *Sulphur is monumental having atomic number 16, its represent symbol* ***S*** *its placed in group* ***6***

Q40. *How many form occurs sulphur both in free state and combined state?*

Ans. Sulphur is found in a form of sulphur beds in the earth

In combined state sulphur occurs in a form of sulphides ***e.g*** *iron pyrite, copper pyrite, zinc blende, galena, cinnabar*

Q39: *what contain one molecule of Sulphur?*

Ans. *Contain 8 atoms of Sulphur combined each other*

Q40: *state the process extraction of Sulphur?*

Ans. *Frash process*

Q41: state *properties of Sulphur?*

Ans. *They are*

- *It is brittle yellow solid*

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

- *It does not conduct electricity*
- *It react with metal to form sulphides*
- *It burns in oxygen to form Sulphur dioxide*

Q42: *what are uses of the Sulphur?*

Ans. *They are*

- *It's used manufacture of gun powder and matches*
- *It's used in vulcanization of natural rubber*
- *Is the manufacture of sulphuric acid*

Q43: *what is the allotropy?*

Ans. *Allotropy is the existence of two or more forms of elements*

Q44: *what are the allotropes?*

Ans. *Is a two or more forms of elements*

Q45: *state the allotropes of Sulphur?*

Ans. *They are*

1: rhombic Sulphur

2: monoclinic Sulphur

Q46: *what is the same and difference b/w monoclinic and rhombic sulphur?*

Ans. *These two allotropes have same chemical properties and different physical properties (different in temperature and shape)*

Q47: *when Sulphur dioxide is formed?*

Ans. ***Is*** *formed when Sulphur burns in air*

Q48: *state the properties of Sulphur dioxide?*

Ans. ***They are***

AL-JAZEERA SECONDARY SCHOOL
HOME OF STUDENTS EDUCATION & BOOKS

- *It is colourless Gas*
- *It is heavier than air*
- *It is soluble in water*

Q49: *what are uses of Sulphur dioxide?*

Ans. They are

- *it is used to bleach wool silk and wood*
- *It is used as sterilizing agent in making soft drinks*
- *It used manufacture of sulphuric acid*

Q50: *how prepared Sulphur dioxide?*

Ans. *It's prepared by heating copper turning with concentrated sulphuric acid*

Q51: *state the process that sulphuric acid is made and catalyst used?*

Ans. *Contact process, and used vanadinum catalyst*

Q52: *who is the king of chemicals?*

Ans. *sulphuric acid*

Q53: *what raw materials for the contact process?*

Ans. *they are*

- *Sulphur or Sulphur dioxide*
- *Air*
- *Water*

Q54: *state the properties of sulphuric acid?*

Ans. they are

- *it is colour less oily liquid*
- *It is oxidizing agent*
- *It is react with alkali*

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

Q55: *what are the uses of sulphuric acid?*

Ans. *they are*

- *It's used in the manufacture of fertilizers*
- *It is used in the manufacture of paints pigment*
- ***M****anufacture of soaps and detergent*

Q56: *how prepared chlorine in laboratory?*

Ans. *Chlorine is prepared in the laboratory by reacting manganese oxide with concentrated hydrochloric acid*

Q57: *how prepared chlorine in industry?*

Ans*. Chlorine is prepared in industry the electrolysis of brine ions present in brine solution*

Q58: *what are the properties of chlorine?*

Ans. They are

- *it's highly poisonous greenish gas which is more denser than air*
- *It has irriting small and its bleaching agent*
- *It react with hydrogen to form metal halides*
- *It reacts with alkaline solutions*

Q59: *what are the uses of chlorine?*

Ans. they are

- *It's used to sterilize water*
- *It's used manufacture of bleaching powder*
- *It is used manufacture of organic solvent*

Q60: *what are uses bromine and iodide?*

Ans. They are

AL-JAZEERA SECONDARY SCHOOL
HOME OF STUDENTS EDUCATION & BOOKS

1: bromine is used in making dyes and pesticides

2: iodine is used printing inks

***Q61:** what are the methods of collecting gazes?*

- *Upwarrd displacement (down ward delivery): more denser than air*
- *Down word displacement (upward delivery): less denser than air*
- *Over water : in soluble in water*

***Q62:** write some compound of chlorine?*

***Ans.** they are*

- *Hydrogen chlorine*
- *Hydrochloric acid*

QUESTIONS AND ANSWERS ABOUT RATE OF REACTION

1) What is Rate of reaction?

An. - is the change in amount of reactant consumed or products formed over specific time

- is a speed that a chemical reaction occurs

2) What is chemical kinetics?

Ans. is the study of rate at which chemical reaction occurs

3) List Fast Reactions?

Ans.

- *precipitation*
- *Neutralization*
- *Displacement*
- *Combustion*

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

4) List slow Reactions?

Ans.

- ❖ *Rusting*
- ❖ *Ripening of fruits*
- ❖ *Weathering process*
- ❖ *Fermentation*

5) What is Catalyst?

Ans. Is a substance that increases the rate of reaction

6) write conditions that affect the rate of reaction?

Ans. Major conditions include

- *The Temperature*
- *The surface area*
- *Concentration of solution*
- *Pressure of gases / nature of reactant*
- *Catalyst*

6) *How Temperature affect the rate of reaction?*

Ans. When Temperature increase the kinetic energy increase then collision increase and finally rate of reaction increase

7) *How Concentration Affect the rate of reaction ?*

Ans. When Concentration increase then Rate of reaction increase

8) *How Surface Area affect the rate of reaction?*

Ans. When surface area increase the rate of contact increase then effective collision increase and finally rate of reaction Increase

AL-JAZEERA SECONDARY SCHOOL
HOME OF STUDENTS EDUCATION & BOOKS

9) *How pressure or nature reactant affect the rate of reaction?*

Ans. When pressure for gases reactants Increase the number of collisions in a certain time intervals increase then the rate of reaction increase

10) *How Catalyst Affect the rate of reaction?*

Ans. When Catalyst increases then the rate of reaction increases by reducing the activation energy

10) What is depending on the rate of reaction?

Ans. Depends on how many successful collisions there are in given unit of time

11) What means Equilibrium?

Ans. Equilibrium means that change is still taking place continuously

12) What means Dynamic?

Ans. Dynamic means no overall change takes place

13) what is the reversible and irreversible reaction?

Ans. - reversible reaction is the reaction which can go either forward and backward direction

- irreversible reaction is the reaction which can go only forward direction

END

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

QUESTIONS AND ANSWERS ABOUT ATOMIC STRUCTURE AND PERIODICITY

Q1: where atom comes from?

Ans. an atom comes from Greek word meaning something that can't be spilt

Q2: write the Dalton's atomic theory?

Ans. they are

- *Atoms are smallest unit of mater*
- *Each element consist of similar atoms*
- *When atoms combine they react in fixed proportion*
- *Atoms can neither be created nor destroyed except Allah*
- *Atoms can't be broken down into similar substance*

Q3: what is nucleus?

Ans. middle part of the electron

- ✓ *It contain proton and neutrons*
- ✓ *Proton are positively charged*
- ✓ *Neutrons have no charge*
- ✓ *So the nucleus is positive charge but its size is tiny*

Q4: what is the electron?

Ans. negatively charged

- ✓ *Move around the nucleus*
- ✓ *Occupy in shell*

Q4: why number of protons and number of neutrons are equal ?

Ans. they are three

- *Atoms have no overall charge, they are neutral*
- *The charge of electrons is equal and opposite to the charge of proton*

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

- *If some electrons are added or removed, the atom become charged and is than ion*

Q5: draw the shape of atom?Ans. Shape of atom is

Q6: write the mass and charge of sub atomic particles?

Ans. particle.	*Charge.*	*Mass*
1. *Proton.*	*+1 unit.*	*One unit*
2. *Neutron .*	*0 unit.*	*One unit*
3. *Electron .*	*-1 unit.*	*Zero unit*

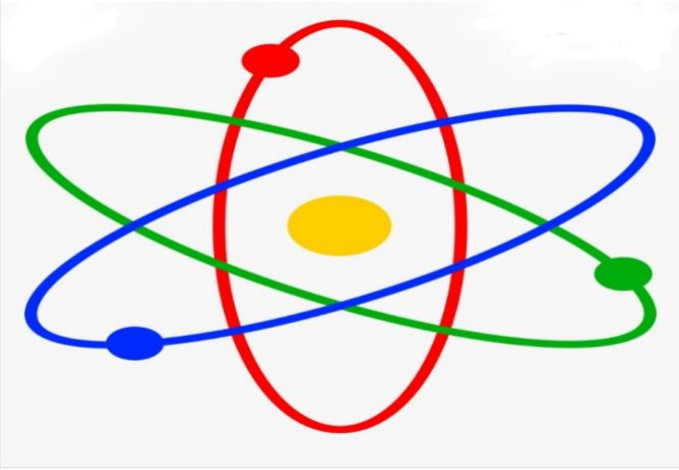
Q7: what is the mass number of atom?

Ans. is the sum of neutron and protons and also known as nucleon number

Q8: what is the atomic number?

Ans. number of protons in an atom and also known as proton number

Neutral atom.	*Anion(-)*	*cation(+)*
Protons Z.	*Protons*	*protons: z*
Neutrons A-Z.	*Neutrons.*	*Neutrons: A-Z*
Electrons Z.	*Electron: Z+charge.*	*Electrons: Z-charge*



HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

Q9: What is the isotopes?

Ans. isotopes are atoms of the same element with the same atomic number but different mass number

Q10: write the arrangement of electrons?

Ans. are four arrangement

- *Principle quantum number(n)=shell*
- *Angular momentum quantum number(L)=sub-shell*
- *Magnetic quantum number(mL)=orbitals*
- *Spin quantum number(Ms)=electrons*

Q11: principle quantum number (n)

- *May have any integral from+1 to infinity*
- *It provides information about the energy of an electron and distance of electron from the nucleus*
- *The energy of an atom depend on principally(n)*
- *The smaller(n) the lower the energy*

Q12: what is the angular momentum quantum number (L)?

Ans. The angular momentum quantum number from 0 to (n-1) it describes sub-shells

Q13: write the general designed letters of (L)?

Ans. designed by letters: s,b,d,f

L=	*o,*	*1,*	*2,*	*3*
	S.	*P.*	*D*	*F*

If n=1 that l=o (there is no shell)= 1s

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

If n=2 that l=0,1 (there is two sub-shell)=2s,2p

If n=3 that l=0,1,2 (three sub-shell)=3s,3p,3d

If n=4 that l=0,1,2,3 (four sub-shell)=4s,4p,4d,4f

Q14: what is the magnetic quantum number (ML)?

Ans. is a number from -1 to 0+1 its describes the orientation of the orbital in space around the nucleus

Q15: what is the spin quantum number (Ms)

Ans. is quantum number that describes the behaviour of specific electron

Q16: What is used spin quantum number?

Ans. used to describe the electron value of Ms either +1/2 or -1/2

Q17: write s,b,d,f blocks orbitals?

Ans. S= sub-shell has 1-orbital which has capacity of 2-electron

P= sub-shell has 3-orbital which has capacity of 6-electron

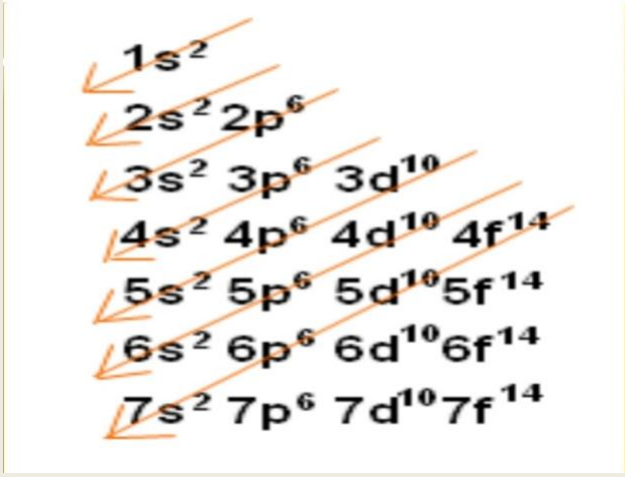
. d= sub-shell has 5-orbital which has capacity of 10-electron

. F= sub-shell has 7-orbital which has capacity of 14-electron

Q18: drow the diagonal rule?

Ans.

AL-JAZEERA SECONDARY SCHOOL
HOME OF STUDENTS EDUCATION & BOOKS



Q19: write the principles that must be followed in rule of box and arrow method?

Ans. the following rules must be followed

- ✓ ***Aufbau principle(Building up principle) state**= "that electrons enter orbitals of lowest energy first and building up to higher energy orbitals"*
- ✓ ***Pauli exclusion principle**: state that no two electrons can have the same four quantum number which means*
  - *Only two electrons can occupy an orbital*
  - *They must have opposite spins*
- ✓ ***Hound's rule(bus seating rule):** state that when electrons occupy orbital of equal energy, they don't pair until they are singly occupied but its only degenerative orbitals*

Q20: write the degenerative and generative orbitals?

Ans. generative orbital is (s) and degenerative orbitals are (p, d ,f)

Q21: define periodic table?

Ans. is the arrangement of the element into groups and periods with same shells

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

Q22: who discovery modern periodic table?

Ans. is hennery Mosley

Q23: list classification of periodic table?

- *Ans. groups and periods*
- *Metals non-metals ,metalloids*
- *Representative element ,transitional metals ,inner transitional*
- *Block (s,b,d,f)*
- *Solid ,liquid ,gas*

Q24: what is the group one?

Ans. alkali metals

- *Members LI ,Na, ,K, Ra , Cs, Fr*
- *They are soft metals and cut with knife*
- *They are stored under the oil*
- *Elements of this family has one valence electron*
- *They lose their valence one electron*
- *They are good conductor of heat and electricity*
- *They found combined with other element due to their reactivity*

Q25: what are group two?

Ans. alkaline ears metals

- *Members are Be, Mg , Ca, Sr , Ba , Ra*
- *Element of this family have two valence electron*
- *They lose two electrons*
- *Most of compounds do not dissolve easy in water*
- *Both group 1and 2 belong to s-block*

Q26: what are group seven?

Ans. halogen

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

- *Members F, Cl, Br, I , At*
- *They are named for their ability to from salt*
- *Element on this group have 7 electron in the valence*
- *They gain one electron to form -1 charge ion*
- *Fluorine is the most reactive for all member*
- *F and Cl are gases Br liquid I is solid A is radioactive element*

Q27: what are group eight ?

Ans. noble gases

- *Members He, Ne, Ar, Kr , Xe , Rn*
- *Colourless and unreactive element*
- *They have 8 electron in the valence*
- *They have no charge b/c they are stable*
- *Group 7 and 8 belong to the p-block*
- *Noble gases react rarely chemists created compound of Xe and F*

Q28: what is the periodicity?

Ans. is the study of periodic trends (atomic ***radius, ionisation energy, electron affinity and electron negativity)***

Q29: *what is the atomic radius?*

Ans. is a size of the atom or is atomic size

Q30: define metallic radius?

Ans. is one half the shortest distance b/w nuclei of adjacent atoms and mostly used for metals

Q31: define covalent radius?

Ans. is one half the shortest distance b/w nuclei of the bonded atoms and mostly used for non-metals

Q32: what happened atomic radius down the group and why?

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

*Ans. atomic radius increase down the group because number of shells (**n**) increase*

Q33: what happened atomic radius across the period and why?

*Ans. Atomic radius decrease across the period because Affective nuclear charge (**Z**eff) increase*

Q34: define Ionic radii?

Ans. Is a measure of the size of an ion

Q35. Differentiate atomic radius and ionic radius according cations and Anions?

*Ans. **in Cations: -** atomic radius of metals is greater than their corresponding ionic radius b/c metals lose shells*

***In Anions: -** the ionic radius of non-metals is greater than their corresponding ionic radius b/c non-metals gained electron*

AL-JAZEERA SECONDARY SCHOOL

Q36. Define Ionization energy?

Ans. is the energy needed to remove electrons

Q37: define

- ***First ionization energy** :is the energy needed to remove first electron*
- ***Second ionization energy:** is the energy needed to remove second electron*
- ***Third ionization energy :** is the energy needed to remove third electron*

***Q38 :** what are the factors influences ionization energy?*

Ans. are the following:-

- ***Effective nuclear charge (Z**eff): is the electrostatic force b/w the protons in the nucleus and electron in their shells*
- ***The distance of the electron from the nucleus***

HOME OF STUDENTS EDUCATION & BOOKS

- ***Shielding effect / screening effect:*** *is the repulsion of inner electrons with outer electrons.*

Q39: what happened ionization energy down the group?

*Ans. ionization energy decrease down the group b/c number of shells (**n**) increase*

Q40: what happened the ionization energy across the period and why?

Ans. Ionization energy increase across the period b/c effective nuclear charge (Zeff) increase and atomic radius decrease

Q41. Define electron affinity?

Ans. is the ability of an atom to attract and hold an extra electron

Q42. What happened electron affinity down the group?

Ans. Electro n affinity decrease down the group

Q43. What happened electron affinity across the period?

Ans. Electron affinity increase across the period

Q44. Define electronegativity?

Ans. is the ability of an atom to attract shared electrons in a covalent bond towards it self

- is the non-metallic character

Q45. What is measured electronegativity?

Ans. Is measured in pouling scale

Q46. What happened electronegativity down the group ?

Ans. Electronegativity decrease down the group b/c number of shells

Q47. What happened electronegativity across the period and why ?

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

Ans. Electronegativity increase across the period b/c effective nuclear charge ***(Zeff)*** *increase.*

QUESTIONS AND ANSWERS ABOUT MOLE AND STOICHIOMETRY

1. *What is the mole?*

Ans. is the Amount of any substance that contains ***Avogadro constant (6.02×10²³)***

2. What is the mole of a substance?

Ans. is the amount of that substance that contains the same number of particles

3. List *some important elements and there relative molecular mass(molar mass).?*

- *Hydrogen* ***H****: 1g/mol.*
- *Carbon* ***C*** *: 12 g/mol.*
- *Nitrogen* ***N****: 14g/mol.*
- *Oxygen* ***O****: 16g/mol.*
- *Fluorine* ***F****: 19g/mol.*
- *Sodium* ***Na: 23g/mol.***
- *Aluminium* ***Al : 27g/mol***
- *Magnesium* ***Mg: 24g/mol.***
- *Iodine* ***I : 127g/mol***
- *sulphur* ***S : 32g/mol***
- *chlorine* ***Cl : 35.5g/mol***
- *copper* ***Cu : 64g/mol***
- *iron* ***Fe : 56g/mol***
- *lead* ***Pb : 207g/mol***
- *calcium* ***Ca : 40g/mol***
- *potassium* ***K : 39g/mol***
- *Bromine* ***Br: 80g/mol***

---

4. Tell the formula of mole?

Ans. ***Mole = mass / molar mass.***

5. *Tell the formula of mass?*

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

Ans. ***Mass = mole × molar mass***

6. Tell the formul*a of 1 mole of particles?*

Ans. ***1mole of particles = 6.02×10²³ particles***

7. *What tells the percentage composition?*

Ans. The percentage composition tells you which elements are in the compound and how much of each there is as a percentage of the total mass.

8. What are the steps of percentage composition?

Ans. are 4 steps only:-

- *Write the formula of the compound*
- *Work out its formula mass*
- *Write the mass of the element as a fraction of the total*
- *Multiply the fraction by 100%*

9. Write formula of percentage% composition?

Ans. $\text{\% composition} = \frac{\text{mass of one element.}}{\text{Total mass}} \times 100\%$

10.*What is the* ***Empirical formula?***

Ans. *is the simplest formula of a compound*

11. Write steps of Empirical formula?

Ans. are three steps:-

- *Divide the actual mass of each element by its molar mass*
- *Divide each ratio obtained in step****1*** *by the simplest ratio*
- *Convert the values in to hole numbers if they are not*

12. What is the ***Molecular formula?***

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

Ans. *is the formula of a compound which shows the exact number if each kind of atoms*

13. List the steps of Molecular formula?

Ans. are 4 steps:-

- *Find the empirical formula*
- *Divide the molecular mass by formula mass*
- *If the quotient is not whole number correct to the nearest whole number*
- *Multiply the empirical by this number*

14. Write Formula ***mole of gases?***

Ans. Mole of gases = Volume of gas (dm^3) molar gas volume (mol/dm^3)

15. *Write formula of* ***Volume of gases?***

Ans. volume of gases = moles of gas × molar gas volume

Note :- molar gas volume *is the volume of one mole of any gas at* ***S.T.P / R.T.P***

- ***1 dm^3 = 1 litter***
- ***1 dm^3 = 1000cm^3***
- ***1dm^3 = 1000ml***

16. *Write value of* ***RTp?***

Ans. RTP = 24dm^3

17. Write *value of* ***STp?***

Ans. STP = 22.4dm^3

18. *What is the molarity?*

Ans. is the number of moles of solute present in one litter of a solution

19. What is the concentration?

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

Ans. is the Amount of solute in grams or moles that is dissolved in1dm³ of a solution

Mole = CV. ; Mole = MV

*20. **What is the stoichiometry?***

***Ans.** is the study of the quantitative relationship between reactant and reactant, reactants and product, product and product in a balanced chemical equation.*

- is the calculation of the quantities of reactants and product involved in chemical reaction.

21. What Avogadro constant consist?

Ans. consists of:-

- ***Atoms or ions** : have relative Atomic mass **R.A.M***
- ***Molecules :** have relative molecular mass **R.M.M***

22 what are the types of stoichiometric relationships?

Ans. are 6 types:-

- ***Mass-mass relationship =***
- ***Mole -mass relationship***
- ***Mole - mole relationship***
- ***Mass- volume relationship***
- ***Mole- volume relationship***
- ***Volume-volume relationship***

23.write steps of mass mass relationship?

Ans. are the following steps:-

- *Write the balanced equation*
- *Write the known and unknown masses above the formula*
- *Write the equation mass below the formula*

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

- *Set up proportion b/w the known and unknown formula*

QUESTIONS AND ANSWERS ABOUT BONDING AND STRUCTURE

1. *What is the bonding?*
   - ✓ *Bonding is the electrostatic force between the positive ion nuclei and the electron from the other atom or*
   - ✓ *Is the union of atoms to form compound*
2. *List types of bonding?*
   - ➢ *Are classified into*

     Major bonds and minor bonds
     - ❖ ***Inter atomic bond*** ⟹ ***Inter molecular bond***
     - ❖ *Ionic bond* *Hydrogen bond*
     - ❖ *Covalent bond* *dipole-dipole force*
     - ❖ *Metallic bond* *vanderwaal's force*
3. *What is the ionic bond?*
   - ✓ *Is a bond between metal and non -metal*
   - ✓ *Is the electrical attraction between the opposite ions*
4. *State properties of ionic compound?*
   - ❖ *They formed metallic cations and non-metallic anions*
   - ❖ *They are soluble in polar solvent but insoluble in non-polar solvent*
   - ❖ *They have high melting and boiling point*
   - ❖ *They conduct electricity in a molten or in solution they don't conduct in a solid state due to lack of free electron*
   - ❖ *They form gain ionic lattice*
   - ❖ *They are hard and brittle*
5. *Define and metallic bond?*
   - ➢ *Metallic bond is the electrostatic attraction b/w the positive metal ions {cations} and the delocalized electron.*
6. *What is the covalent bond?*
   - ✓ *Is a bond b/w non-metals*

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

- ✓ *Is a bond that involves sharing electron*

7. *List classifications of covalent bond?*
   - *Single covalent bond*
   - *Double covalent bond*
   - *Tipple covalent bond*
8. *Define co-ordinate covalent bond?*
   - ✓ *Co-ordinate covalent bond is formed when both electron of the bond are donated by one atom*
9. *Covalent bond can be classified by*
   - ➢ *Polar covalent bond and non-polar covalent bond*

10 Compare polar and non-polar covalent bond?

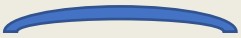
Polar covalent bond	***Non-polar covalent bond***
The bonded electron are un equal un equal shared	*The bonded electron are equally shared b/w two atoms*
The bonded atoms are different	*The bonded atoms have similar electro negativities*
Each bonded atoms have different electronegativity	*The bonded atoms are the same e.g. chlorine molecule*

10. *List the properties of covalent compound?*
    - ➢ *They formed from non-metals*
    - ➢ *They are discrete {separate} molecules*
    - ➢ *They are weak compounds*
    - ➢ *They have law melting and boiling point except covalent structure*
    - ➢ *They are poor conductor of heat and electricity except graphite*
    - ➢ *They are insoluble in water except polar molecule*
11. *State the covalent structure?*

Covalent structure

Simple molecular *Giant structure*

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

Polar *Non-polar* *Graphite* *Diamond*

12. *Compare ionic, covalent and metallic compounds?*

BONDING	***IONIC***	***COVALENT***	***METALLIC***
STRUCTURE	*Giant ionic*	*Giant covalent & S. Molecule*	
MELTING POINT	*High*	*High* *Law*	*High*
CONDECTIVITY	*Molten or in solution*	*NO* *NO*	*Yes*
EXAMPLE	*Nacl*	*Diamond* *water*	*Zinc*

13. *What is the intermolecular force?*
    - *Arises with in molecules of covalently bonded atoms*
14. *Define vanderwaal's force?*
    - *Is a force of attraction between non-polar compound*
15. *What is the dipole-dipole force?*
    - *Is a type of intermolecular force exist b/w polar molecule*
16. *What is the hydrogen bond?*
    - *Is a especial form of dipole-dipole force its nor really true chemical bond*
17. *In this three force which is strongest?*
    - *Hydrogen bond*
18. *In this three force which is medium?*
    - *Dipole-dipole force*
19. *In this three force which is weakest?*
    - *Vander Waal's force*
20. *What are the rules of VSEPR tells are?*
    - *All bonded electrons pairs and all long pairs arrange themselves as for a part in shape as possible*
    - *Long pairs repel more strongly than bonded pairs*

AL-JAZEERA SECONDARY SCHOOL
HOME OF STUDENTS EDUCATION & BOOKS

21. List electron shared and their shapes?

ELECTRON SHARED	***SHAPE***
Two pair of electron	*Linear*
Three pair of electron	*Trigonal Plannet*
Four pair of electron	*Tetra Hedral*
Five pair of electron	*Trigonal Bipyramidal*
Six pair of electron	*Octahedral*

22. State types of shapes?

- *Polar {bent or v shaped }*
- *Non-polar {linear }*

23. State molecular structure?

- *Giant ionic structure*
- *Giant metallic structure*
- *Covalent structure*
- *Simple molecular structure*
- *Giant covalent structure*

24. Properties of diamond?

- *Each carbon bonds with four other carbon atoms*
- *Its hardest substance known*
- *It doesn't dissolve in water*
- *It doesn't conduct electricity*
- *It has very high Melting and Boiling point*
- *Contain only inter atomic bonds*

25. Uses of diamond?

- *Making jewellery*
- *To drill hard rocks in mining*
- *To cut metals and classes*

26. Properties of Graphite?

- *It is the only non-metal that conduct electricity*

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

- *Its soft and slippery*
- *Contain both inter-atomic and intermolecular bond*
- *It has high Melting and Boiling point*

27. Uses of Graphite?

- *It's used as an electrode in electrolysis*
- *It's used as lubricant to reduce friction*
- *It's used as manufactured as pencil*

28. List properties of simple molecular structure?

- *Insoluble in water unless they react with it*
- *They are soluble in organic solvent*
- *They don't conduct electricity*
- *Same molecule are include carbon dioxide and methane*

QUESTIONS ANS ANSWERS ABOUT ORGANIC CHEMESTERY

Q1: define organic chemistry?

Ans. is a branch of chemistry that studies carbon containing compounds

Q2: define carbon?

Ans. is a tetra valence it's able to form stable covalent bonds with itself and many non- metals

Q3: why is carbon is a unique element?

Ans. because are following

- ✓ *Carbon uses all the valence electrons to form four strong covalent bond*
- ✓ *Carbon can covalently bond to form single, double, or triple bonds with it self*
- ✓ *Carbon atoms can covalently bond to form very long chain or ring*

HOME OF STUDENTS EDUCATION & BOOKS

Q4: list the types of organic chemistry?

Ans. are two main and there are

1. *Hydrocarbon*
2. *Hydrocarbon derivative*

Q5: define hydrocarbon?

Ans. Are a compound containing only carbon and hydrogen atom

Q6: write the types of hydrocarbon?

Ans. Are

1. *Saturated (alkanes)*
2. *Un saturated (alkenes, alkynes)*

Q7:write the types of hydrocarbon derivative

1. *Alcohols*
2. *Aldehydes*
3. *Ketones*
4. *Carboxylic acid*

Q8: List types of formulas?

Ans. there are a different ways of representing formula

- *General formula*
- *Molecular formula*
- *Structural formula*
- *Displayed formula*
- *Skeletal formula*

Q9: define a homologous series?

Ans. there are compounds having the same general formula but different carbon chain length

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

Q10: what is the functional group?

Ans. A group of atoms with in an organic compound that are responsible for the reactions

Q11: what are alkanes?

Ans. Are hydrocarbons with a single covalent bond between carbon atoms

Q12: write the general formula of alkanes?

Ans. Are CnH2n+2 they are all homologous series

Q13: write of homologous series?

Ans. Are

- *They can be represented by general molecular formula*
- *They different neighbouring member by CH-unit*
- *They have similar chemical properties*
- *They can be prepared by a general method*
- *They have the same functional group*

Q14: write the classification of alkanes?

- *Normal alkanes*
- *Branched alkanes*

Q15: what us the nomenclature?

Ans. is a system for naming organic compound is called IUPAC

- *Find the longest carbon chain*
- *Numbering the carbon atoms in this longest chain*
- *If there is branching of equal distance from both ends begin numbering at the end nearest the branch that is first in alphabetic order*
- *Use the appropriate prefix to group like; di, tri, tetra.....*

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

- *Use coma(,) to separate numbers and hyphen(-) to separate numbers and letters*

Q16: name the follow alkane CH3-CH2-CH2-CH3. ?

Ans. are butane

Q17: Write the physical properties of alkanes?

Ans. they are

- *The first four members are gases, C5- C20 are liquid and the higher members are solid*
- *Liquid alkanes are non- polar and in soluble in water but soluble inorganic solvents*
- *Boiling point of alkanes have lower*
- *They are bad conductor of electricity*
- *They have low density*

Q18: write the chemical properties of alkanes?

Ans. Are two and they are

- *Combustion reaction*
  - *Complete combustion*
  - *Incomplete combustion*
- *Substitution reaction*
- *Pyrolysis or thermal decomposition*

Q19: list the uses if alkanes:

Ans. Are three and they are

- *Methane is a source of hydrogen used in a preparation of ammonia*
- *Methane is used to prepare methyl chloride*
- *Methane is used to make block carbon like graphite*

Q20: define alkenes?

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

Ans. Are hydro carbons that have double bond

Q21: write the general formula of alkenes?

Ans. is CnH2n

Q22: give example of alkenes?

Ans. is ethane, propene

Q23: list physical properties of alkenes?

Ans. they are

- ✓ *They are colour less gases, solids, and liquid*
- ✓ *They are slightly soluble in water*
- ✓ *The first four members are gases at (RTP)*
- ✓ *They are lighter than water*
- ✓ *There are physical properties increase with increasing of carbon chain*

Q24: tell the preparation of alkenes?

- ✓ *Dehydration of alcohol*
- ✓ *Dehydrogenation*

Q25: what is the isomerism?

Ans. is the existence of two or more compounds which have the same molecular formula but different structural formula

Q26: write the types of isomerism?

Ans. Are two

- ✓ *Structural isomerism*

  (a) Chain isomerism

  (b) Position isomerism

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

(c) Functional group isomerism

✓ *Stereo isomerism*

(a) Geometric isomerism

(b) Optical isomerism

Q27: define structural isomerism?

Ans. compound which have the same molecular formula but different structural formula

Q28: what is the chain isomerism?

Ans. a compounds having the same molecular formula but different the carbon chain

Q29: what is the positional isomerism?

Ans. A compound having the same molecular formula but different the functional group

Q30: what is the geometric (cis-trans) isomer?

Ans. compound have same molecular formula but different the arrangement of the carbon chain

Q31: what us the optical isomers?

Ans. isomers having the mirror image

Q32: define alkynes?

Ans. Are unsaturated hydrocarbons they contain carbon-carbon triple bond

Q33: write the general formula of the alkynes?

Ans. CnH2n-1 and they are homologous series

Q34: write the physical properties of alkynes?

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

Ans. they are

- ✓ *The first three alkynes are gases those containing five to thirteen are liquid and the above members are solid*
- ✓ *The melting and boiling point of alkynes increase as the molecular mass increase*
- ✓ *Alkynes are insoluble in water but soluble in organic solvents*
- ✓ *All alkynes are lighter than water*

Q35: write the chemical properties of alkynes?

Ans. are many chemical properties and they are

- ➢ *Addition reaction*
  (a) Hydrogenation
  (b) Halogenation
  (b) Hydration
- ➢ *Oxidation*
- ➢ *Polymerization reaction*

Q36: define alcohols?

Ans. Are hydrocarbon derivative and form homologous series

Q37: write the general formula of alcohols?

Ans. CnH2n+1OH

Q38: define ethanol?

Ans. Is an alcohol in alcoholic drinks its good solvent

Q39: write the classification of alcohols?

Ans. are classified in to two according to number of hydroxyl (COH)

- ➢ *Monohydric alcohol*
- ➢ *Polyhydric alcohol*

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

Q40: write the types of alcohol?

Ans. there are three types of alcohol

- *Primary alcohol*
- *Secondary alcohol*
- *Tertiary alcohol*

Q41: write the physical properties of alcohols?

Ans. they are

- *Colour less and flammable*
- *They are miscible in water*
- *Boiling point increase with increasing molecular mass*
- *Solubility they are soluble in organic solvents*
- *Ethanol has a boiling point of 78c*

Q42: tell the reactions of alcohol?

Ans. are two reactions

1. *Combustion*
2. *Oxidation of alcohol*

Q43: write the uses the alcohol?

Ans. are many uses and they are

- *Alcohol are used in alcoholic beverages*
- *They are used as a solvent as well as fuel*
- *They are used as coolant in aeroplane engines*

Q44: write the preparation of alcohol?

1. *Hydration of alkenes*
2. *Fermentation of sugar*

Q45: define aldehyde?

AL-JAZEERA SECONDARY SCHOOL
HOME OF STUDENTS EDUCATION & BOOKS

Ans. Is the first oxidation product of primary alcohols

Q46: write general formula of aldehyde?

Ans. CnH2nO

Q47: define ketones?

Ans. Are fist oxidation products secondary alcohol

Q48: write physical property of aldehyde and ketones?

- *Ans. high melting point*
- *Soluble water*

Q49: define carboxylic acid?

Ans. are organic compound that contain (CooH)

Q50: write the general formula of carboxylic acid?

Ans. CnH2n+1cooH

Q51: write the physical property of carboxylic acid?

- *Ans. boiling point increase withe the increase of molecular mass*
- *The first four members are soluble in water*
- *They are weak acid*

Q52: list chemical property of carboxylic acid?

- *Ans. react with metals*
- *React with carbonates*
- *React with base*

Q53: define ester?

Ans. Is a sweet smelling substance formed when the alcohols react with carboxylic acid in the presence of few drops of concentrated acid as actalyst

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

Q54: what is the esterification?

Ans. Is the reaction used to form ester

Q55: write the physical property of ester?

- *Ans. boiling point increase with increase of molecular mass*
- *Solubility: All ester are soluble inorganic solvent*

Q56: list uses of ester?

- *Ans. ester are uses solvents of oil ,fats paints*
- *It's used in the manufacture of perfumes*

QUESTIONS AND ANWERS ABOUT Enthalpy changes

1. *What is the change in chemical reactions?*
   Answer
   Most chemical reactions give out or take in energy as they proceed
   The amount of energy in evolved when a chemical reactions takes place is important for many reasons
   For Example
   - *We can measure the energy values of fuels*
   - *We can calculate the energy requirements for industrial processes*
   - *It help us to predict whether or not a reaction will take place*
2. *Define thermochemistry?*
   Answer
   Is the study of heat changes during chemical reactions
3. *There overall changes may result in energy being given out or taken in*
   - *If the end of the reactions energy has been given out the reactions is exothermic*
   - *If at the end of the reactions energy has been taken in the reactions in endothermic*
4. *Exothermic and endothermic reactions?*

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

Answer

Same reactions give out heat as they proceed

Exothermic reactions neutralizing an acid with an alkali is an Example of an exothermic reaction

5. *The Quantities?*

Answer

The amount of heat given out or taken in during chemical reaction depends on the Quantity of reactant

6. *Enthalpy changes?*

Answer

Is the heat energy exchange with the surrounding at constant pressure

7. *There are standard conditions for measuring enthalpy changes?*

Answer

- *A pressure of 100 kpa (approximately normal atmospheric pressure*
- *A temperature of 298 kpa (around normal room temperature 25c^{o})*

8. *What the standard state?*

Answer

Is the physical state if substance under standard conditions

9. *What are the physical states of the reactant and products?*

Answer

The physical states (solid liquid or gas) of the reactant and products also affect the enthalpy change of a reaction

10. *Exothermic reactions?*

Answer

During an exothermic reactions heat energy is lost from the chemical and is released to the surroundings

11. *The standard enthalpy change of neutralization DH^{o}*

Answer

Is the energy change that accompanies the neutralization of acid by a base to form

12. *The standard enthalpy change of formation?*

Answer

AL-JAZEERA SECONDARY SCHOOL
HOME OF STUDENTS EDUCATION & BOOKS

Is the enthalpy change that takes place when one mole of compound

13. *The standard enthalpy change of combustion?*

Answer

Is the enthalpy change that takes place when one mole of substance reacts completely with oxygen under standard conditions

14. *Temperature?*

Answer

Is related to the average kinetic energy of the particles in a system

15. *Hint?*

Answer

The word ..heat.. and temperature are often used to mean the same thing

16. *Heat?*

Answer

Is measure of the total energy of all the particles present in a given amount of substance

17. *Enthalpy change of a reaction?*

Answer

Is the heat given out or taken in as the reactions proceeds

18. *Specific heat capacity?*

Answer

Is the amount of heat needed to raise the temperature of 1g of substance

19. *Measurements?*

Answer

- *Mass of the compound to be burnt*
- *Volume of water*
- *Initial temperature of water (before combustion)*
- *Final temperature of combustion (after combustion)*

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL

MEMBERS OF THE GROUP OR WRITERS

- ZAKARIE AHMED ADEN
- ABDI FATAH HUSSIEN OSMAN
- KHALID ABDI RISAQ MOHAMED
- HASSEN RASHIID HASSEN
- SICIID ZALEBAN GUURE
- AHMED ABDI KAREN AHMED
- AHMED JAMAC MOHAMED
- HODAN ZALAH YOUSUF
- RAAQIA ABDILAHI ABDI
- HOODO MOHAMED MUSE
- NAJMA MOHAMED MUSE
- NIMCO MOHAMED ABDILAHI
- SHABAC MOHAMED CUSE
- MUMTAZ MICRAJ HAJI HASSEN

ACADAMIC YEAR 2019 _ 2020

REFERENCE OF THIS BOOK

WhatsApp # +252634791140 or +252633010484

HOME OF STUDENTS EDUCATION & BOOKS
AL-JAZEERA SECONDARY SCHOOL