Chapter V

Section A

1. All metals are good ------- agents and easily oxidised by themselves.

(a) oxidizing

(b) reducing

(c) conducting

(d) displacing

2. The reactivity series of metals is a series in which metals are arranged in order of reactivity from --------.

(a) lowest to highest

(b) highest to lowest

(c) hardest to softest

(d) softest to hardest

3. Metals, which are the highest reactivity, can be ------- extract.

(a) easily

(b) hardly

(c) moderately

(d) reasonably

4. How should metals more reactive than carbon be extracted from their ores? (a) by oxidation

(b) by reduction

(c) by displacement

(d) by electrolysis

5. We use gold as jewelry because

(a) colour of gold is yellow

(b) lightest metal

(c) very unreactive, so won't react with your skin

(d) heaviest metal

6. Metals below carbon can be extracted from their ores by reduction with

------ (a) hydrogen

(b) carbon

(c) more reactive metal

(d) its ore

7. Metals below hydrogen in reactivity series can -------

(a) neither be reacted with water nor acid

(b) react with acid but not react with water

(c) react with hot water

(d) react with cold water

8. What happens when copper is put into a beaker of water?

(a) produce hydrogen

(b) tarnished

(c) nothing happens, copper is not reactive enough to react with water

(d) violently react with water, copper very easily reacts with water 9.

9. Aluminium is an important metal with many uses. Some of its properties are listed

(1) it is a good conductor of heat.
(2) it has a low density.
(3) it has an oxide layer that prevents corrosion.

Which set of properties help to explain the use of aluminium for cooking and storing food?

(a) 1 only

(b) 1 and 2 only

(c) 2 and 3 only

(d) 1, 2 and 3

10. The table shows the results of adding three metals, P, Q and R, to dilute hydrochloric acid and to water

Metals	Dilute hydrochloric acid	water
P	Hydrogen produced	Hydrogen produced
Q	No reaction	No reaction
R	Hydrogen produced	No reaction

The most reactive to less reactive order of above metals was

(a) P > R > Q

(b) P > Q > R

(c) R > Q > P

(d) R > P > Q

11. Which property makes aluminium ideal for making food containers? (a) Conducts electricity

(b) Conducts heat

(c) Mechanical strength

(d) Resistance to corrosion

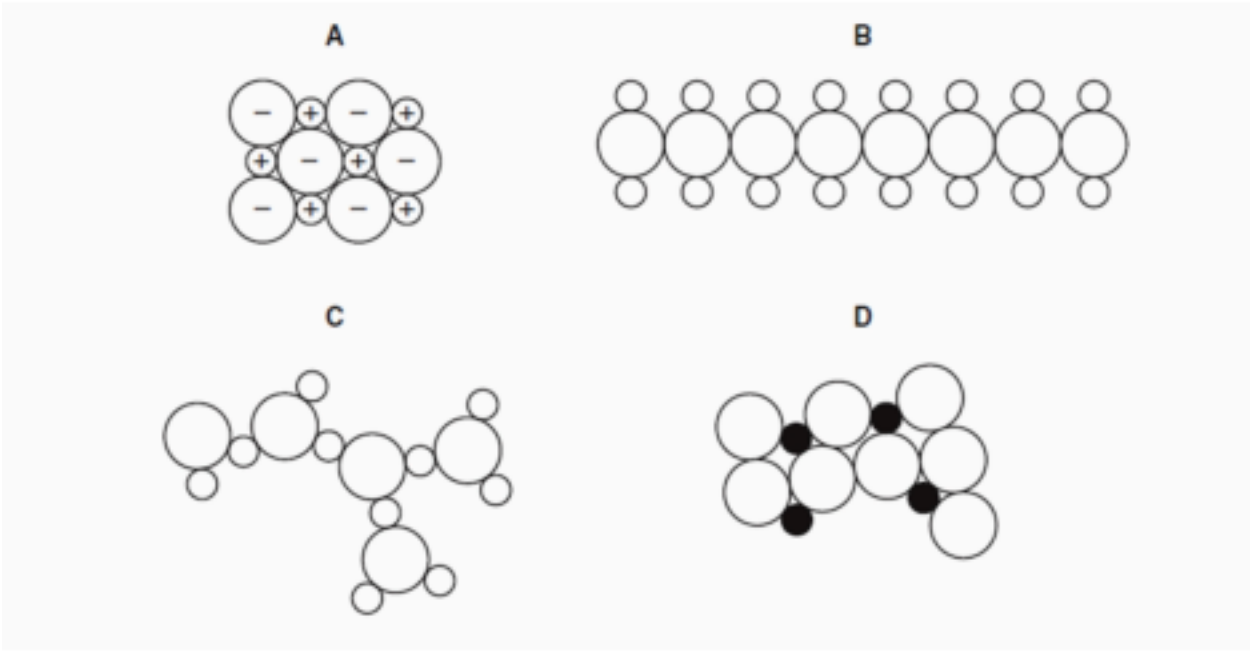
12. Which substance is **not** involved in the extraction of iron from hematite? (a) Carbon

(b) Carbon monoxide

(c) Calcium carbonate

(d) Nitrogen

13.Which diagram could represent the structure of an alloy? D



Ans:D

14.Pure metals conduct electricity and can be hammered into different shapes. Why are metals sometimes used as alloys?

(a) Alloys are cheaper than the metals they are made from

(b) Alloys are easier to hammer into different shapes.

(c) Alloys are harder and keep their shape better

(d) Alloys conduct electricity better.

15.Below are some metals in decreasing order of reactivity

Magnesium

Zinc

Iron

Copper

Titanium reacts with acid and cannot be extracted from its ore by heating with carbon. Where should titanium be placed in this list?

(a) Below copper

(b) Between iron and copper

(c) Between magnesium and zinc

(d) Between zinc and iron

16. The moderately reactive metals such as magnesium, zinc and iron react ----- with water.

(a) vigorously

(b) quickly

(c) slowly

(d) never

17. platinum and gold do ---- react with the oxygen in the air.

(a) vigorously

(b) quickly

(c) slowly

(d) not

18. Reactive metals such as potassium, sodium and calcium react with cold water and generally we can represent

(a) $X + H_2O \rightarrow XOH + H_2$

(b) $X + H_2O \rightarrow X_2 + H_2$

(c) $X + H_2O \rightarrow XOX + H_2$

(d) $X + H_2O \rightarrow X_2O + H_2$

19. In a chemical reaction in which a more reactive metal substitute a less reactive metal from its compound is called ------- reaction.

(a) decomposition

(b) displacement

(c) addition

(d) combustion

20.What is formed when magnesium burns in air?

(a) burn quickly with a bright white flame

(b) burns quickly with a bright yellow flame

(c) burns slowly with a bright white flame

(d) burns slowly with a bright yellow flame

21.What happens when copper is put into a beaker of water?

(a) react violently with cold water, float, and catch fire

(b) reacts very slowly with cold water, but vigorously with steam

(c) does not react with cold water, reacts with steam while heating (d) do not react with both water and steam

22.What is formed when sodium reacts with hydrochloric acid?

(a) explode

(b) reacts moderately

(c) reacts very slowly

(d) no reaction

23.$Ag + KNO_3 \rightarrow$ -----

(a) $AgNO_3 + K$

(b) $KAg + NO_3$

(c) $AgNO + KNO_2$

(d) No reaction

24.$Fe + Pb(NO_3)_2 \rightarrow$ --------

(a) $PbFe + NO_3$

(b) $Pb + Fe(NO_3)_2$

(c) $FeNO_3 + PbNO_3$

(d) $FeNO_2 + PbNO$

25.$Mg\ (s) + CuO\ (s) \xrightarrow{\Delta}$ -----

(a) MgO(s) + CuO(s)

(b) MgO(s) + Cu(s)

(c) MgCuO

(d) No reaction

26. In the balanced equation – $aFe_2O_3 + bH_2 \rightarrow cFe + dH_2O$ The value of a,b,c,d are respectively

(a) 1, 1, 2, 3

(b) 1, 1, 1, 1

(c) 1, 3, 2, 3

(d) 1, 2, 2, 3

27. When dilute hydrochloric acid is added to iron fillings – (a) hydrogen gas and ferric chloride are produced. (b) chlorine gas and ferric hydroxide are produced. (c) no reaction takes place.

(d) iron salt and water are produced.

28. Name two metals that can only be extracted by electrolysis. (a) Zinc and Iron

(b) Copper and Silver

(c) Potassium and Sodium

(d) Tin and Lead

29. Industrially, metals are extracted from ----.

(a) rock

(b) mineral

(c) ore

(d) vitamins

30. Copper is extracted by ---- method.

(a) self-reduction

(b) carbon reduction
(c) electrolysis
(d) froth floatation

31.The main source of copper ore is -----

(a) copper galena
(b) copper oxide
(c) copper pyrites
(d) copper bauxite

32.In a blast furnace, iron (III) oxide is converted into iron and carbon monoxide is converted into carbon dioxide, as shown in the equation:

$Fe_2O_3 + 3CO \rightarrow 2Fe + 3CO_2$

What happens to each of these reactants?

(a) Iron (III) oxide is reduced and carbon monoxide is oxidized
(b) Iron (III) oxide is oxidized and carbon monoxide is reduced
(c) Both iron (III) oxide and carbon monoxide are oxidized
(d) Both iron (III) oxide and carbon monoxide are reduced

33.------ is added into the container to dissolve the alumina because it has a lower melting point than alumina and it can reduce the temperature of fusion.

(a) salt
(b) acid
(c) molten cryolite
(d) molten aluminum

34.Both dilute and concentrated nitric acids ----- react with aluminium. (a) vigorously
(b) quickly
(c) very slowly
(d) not

35.The reduction of the metallic oxide with aluminium is known as the

----- (a) Synthesis reaction

(b) Thermite reaction

(c) Endothermic reaction

(d) Displacement reaction

36.Iron is extracted from its ore (hematite) in the blast furnace. Which gas is produced as a waste product?

(a) carbon dioxide

(b) hydrogen

(c) nitrogen

(d) oxygen

37.Which statement is incorrect?

(a) Carbon dioxide is a waste product in the extraction of iron.

(b) Carbon monoxide is a reducing agent.

(c) The extraction of iron from hematite involves reduction.

(d) When iron is converted into steel, oxygen is used to oxidise the iron.

38.Iron is extracted from its ore in a Blast Furnace. Hematite, coke, limestone and hot air are added to the furnace. Which explanation is not correct? (a) Coke burns and produces a high temperature.

(b) Hematite is the ore containing the iron as iron oxide.

(c) Hot air provides the oxygen for the burning.

(d) Limestone reduces the iron oxide to iron.

39.Many metals are extracted from their ores by heating the metal oxide with carbon. Which metal cannot be extracted using this method?

(a) Aluminium

(b) Copper

(c) Iron

(d) Zinc

40. Some metals react readily with dilute hydrochloric acid. Some metals can be extracted by heating their oxides with carbon. For which metal are both statements correct?

(a) Calcium

(b) Copper

(c) Iron

(d) Magnesium

41. Copper is a transition element used to make saucepans. Which property is **not** correct for copper?

(a) good conductor of heat

(b) insoluble in water

(c) low melting point

(d) malleable (can be hammered into shape)

42. Which metal would be suitable for all of the following uses?

- making aircraft bodies
- making food containers
- making overhead power cables

(a) Aluminium

(b) Brass

(c) Mild steel

(d) Pure iron

43. Some properties of aluminium are listed.

1. It has mechanical strength.
2. It is resistant to corrosion.
3. It has a low density.
4. It conducts heat.

Which **three** properties make aluminium useful for making the bodies of

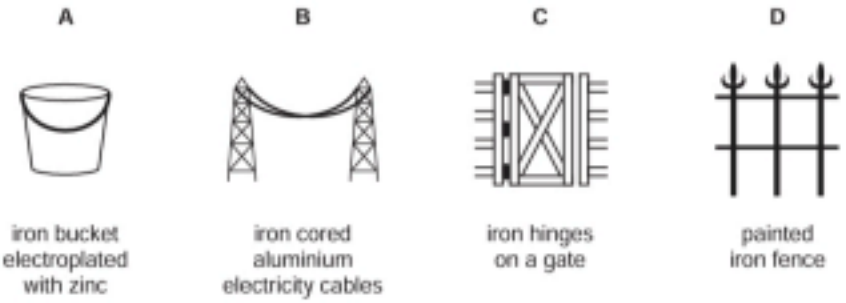
aircraft? (a) 1, 2 and 3

(b) 1, 2

(c) 1, 3 and 4

(d) 2, 3 and 4

44.The diagrams show four uses of iron. In which of these uses is the iron most likely to rust? C



Ans: C

45.Which diagram shows a common use of stainless steel? A

Ans: A

46.Stainless steel is an alloy of iron and other metals. It is strong and does not rust but it costs much more than normal steel. What is **not** made from stainless steel?

(a) Cutlery

(b) Pipes in a chemical factory

(c) Railway lines

(d) Saucepans

47.Which of the following is **not** an alloy?

(a) Solder

(b) Silver

(c) Bronze

(d) Brass

48.Which of the following mixture of metals is used in preparing brass vessels? (a) Zinc and copper

(b) Copper and iron

(c) Nickel and Zinc

(d) Iron and Nickel

49.What is the primary reason for creating alloys?

(a) To reduce the cost of production

(b) To increase the weight of metals
(c) To enhance or modify the properties of metals

(d) To change the colour of metals

50.Rose gold contain Au (75 %), Cu (22.25 %) and Ag (5%) the main used of rose gold is

(a) Body of aeroplane

(b) Computer chip

(c) Jewellery

(d) Cutting tools

Chapter V

Section B

1. Alloy X is strong and has a low density.
Alloy Y is heavy but is resistant to corrosion.
Which could be used for X and Y?

Bridge supports Aircraft Overhead cables

A. X X Y

B. X Y Y

C. Y X X

D. Y Y X

2. Iron from a blast furnace is treated with oxygen and with calcium oxide to make steel. Which substances in the iron are removed?

Oxygen removes Calcium oxide

A Carbon Acidic oxide

B Carbon Basic oxide

C Iron Acidic oxide

D Iron Basic oxide

3. Iron is obtained from its ore in a blast furnace and is used to make steel. Iron obtained from the blast furnace is contaminated with .....1..... . In order to remove this substance, ...2..... is passed through the molten iron. .....3..... is also added to remove oxides of phosphorus and silicon which are .....4..... Which words complete the sentences about the conversion of iron to steel?

A Carbon Nitrogen Calcium carbonate Acidic

B Carbon Oxygen Calcium oxide Acidic

C Carbon Oxygen Calcium oxide Basic

D Sand Oxygen Calcium oxide basic

4. Iron is extracted from its ore in a Blast Furnace. Hematite, coke, limestone and hot air are added to the furnace. Which explanation is **not correct**?

A. Coke burns and produces a high temperature.

B. Hematite is the ore containing the iron as iron oxide.

C. Hot air provides the oxygen for the burning.

D. Limestone reduces the iron oxide to iron.

5. The table shows the results of adding three metals, P, Q, R to dilute hydrochloric acid and to water. Metals Dilute hydrochloric acid water

P. Hydrogen produced Hydrogen produced

Q. No reaction No reaction

R. Hydrogen produced No reaction

What are the order of reactivity of the metals
Metals More reactive → less reactive

A. P R Q

B. P Q R

C. R Q P

D. R P Q

6. Complete the word equation: calcium + water

A. Calcium oxide + hydrogen

B. Calcium oxide + carbon dioxide

C. Calcium hydroxide + water

D. Calcium hydroxide + hydrogen

7. Zinc do not react with water but react quite slowly react with steam, the complete reaction is

A. $Zn + H_2O \rightarrow ZnO + H_2$

B. $Zn(l) + H_2O(l) \rightarrow ZnO(s) + H_2(g)$

C. $Zn(s) + H_2O(g) \rightarrow ZnO(s) + H_2(g)$

D. $Zn(s) + H_2O(g) \rightarrow Zn(OH)_2(s) + H_2(g)$

8. A piece of magnesium is placed in the blue copper II sulphate solution and stirred, the complete reaction is ------ and the solution will become -----.

A. $Mg + CuSO_4 \rightarrow Cu + MgSO_4$, deep blue

B. $Mg(s) + CuSO_4(aq) \rightarrow Cu(s) + MgSO_4(aq)$, colourless

C. $Mg(s) + CuSO_4(aq) \rightarrow MgS(s) + CuO(aq)$, colourless

D. $Mg(s) + CuSO_4(aq) \rightarrow Cu(s) + MgSO_4(s)$, deep blue

9. Since aluminium is more reactive than carbon, aluminium has to be extracted with -------- from ------ ore.

A. Reduction, Galena

B. Forth flotation, Haematite

C. Electrolysis, bauxite

D. Electrolysis, Argentite

10. In its simplest form, bronze is an alloy of which metals? And bronze is used in ship propellers because ----.

A. Copper and tin, very hard and strong

B. Copper and zinc, high density and strong

C. Copper, zinc and nickel, soft and light

D. Copper, Tin and lead, shinning

11. Rose gold is an alloy consisting primarily Au and others were ----- and -----.

A. Cu and Mg

B. Cu and Ni

C. Cu and Ag

D. Cu and Fe

12. Manganese steel is used in ----- because of ------.

A. Cable, hard

B. Nail, malleable

C. Rock crushers, extremely hard

D. High speed cutting tools, resistance to corrosion

13. Corrosion is a chemical reaction that involves

A. The inside of the object changes from an element to a compound

B. The surface of the object changing from an element to a compound

C. Nothing happens

D. The surface of an object changes from one element to another element

14. Which of the following is not an example of physical protection

A. Greasing

B. Attaching the metal to negative terminal of the battery

C. Electroplating

D. Galvanizing

15. Recycling can be beneficial to the environment, the main stages of metal recycling process are:

A. Purification, painting and reselling

B. Collection, sorting, processing, distribution

C. Melting, purification, solidifying

D. Collection and distribution

==========

Chapter VI

Section A

1. Generally non- metals have relatively ----- melting points, boiling points, densities and electrical conductivities.

   (a) high

   (b) low

(c) enough

(d) no

2. Generally, non – metals are -------- of heat and electricity.

   (a) good insulators

   (b) good conductors

   (c) good cooking utensils

   (d) good resistances

3. Nonmetals have relatively ----- ionization energy, electron affinity and electronegativity.

   (a) low

   (b) high

   (c) medium

   (d) no

4. A nitrogen molecule has two nitrogen atoms joined together by ---- covalent bonds.

   (a) one

   (b) two

   (c) three

   (d) four

5. Nitrogen has ---- smell.

   (a) fishy

   (b) sweety

   (c) pungent

   (d) without

6. The Earth's atmosphere is made up of about ------ percent nitrogen.

   (a) 1

(b) 50

(c) 78

(d) 90

7. The chemical symbol for Chile saltpetre is ------.

(a) $NaNO_2$

(b) $NaNO_3$

(c) $NaNO_4$

(d) Na_2NO_3

8. Industrially, elemental nitrogen can be manufactured by ------- of liquid air.

(a) distillation

(b) fractional distillation

(c) combustion

(d) reduction

9. If there were only CO_2, N_2 and O_2 in the air, if this air is passed into caustic soda solution, only --- will be absorbed.

(a) O_2 and N_2

(b) N_2 and CO_2

(c) CO_2

(d) N_2

10. Heated copper + air (N_2 and O_2) → 2----- + N_2

(a) CuO

(b) Cu_2O

(c) $Cu(NO_3)_2$

(d) Cu_2NO_3

11. Urea is an important nitrogen fertilizer and its symbol is ----.

(a) NH_4NO_3

(b) $(NH_4)_2SO_4$

(c) $CO(NH_2)_2$

(d) $Cu(NH_4)_2SO_4$

12. Nitrogen has --- oxidation number.

(a) +3

(b) +5

(c) variable

(d) fix

13. Dinitrogen oxide gas ------ is used as anesthetic for minor surgical operation.

(a) laughing gas

(b) natural gas

(c) ammonia gas

(d) nitrosylazide gas

14. The oxidation number of Nitrogen in N_2O_5 is ----.

(a) +1

(b) +3

(c) +5

(d) -1

15. Which of the following is true about dinitrogen oxide?

(a) It is yellow colour

(b) The oxidation state of nitrogen is +5

(c) It is basic nature

(d) It is a colourless gas

16. Nitrogen monoxide reacts with oxygen to form -----.

(a) nitrogen dioxide

(b) dinitrogen oxide

(c) dinitrogen pentoxide

(d) nitroso

17. What temperature does dinitrogen oxide (N_2O) dissociate to nitrogen and oxygen?

(a) Below 543 °C

(b) Above 600 °C

(c) Below 600 °C

(d) Below 100 °C

18. The most thermally stable hydride of nitrogen is ----.

(a) Ammonia

(b) Ammonium

(c) Amino acid

(d) Nitride

19. Ammonia is manufactured on a large scale by the ------.

(a) Frasch process

(b) Haber process

(c) Oxidation process

(d) Electrolytic process

20. In the ammonia production, nitrogen and hydrogen are mixed in the ratio of 1:3 by -----.

(a) Mass

(b) Volume

(c) Pressure

(d) Density

21. In the ammonia production process ---- is use as catalyst.

(a) Sulphur

(b) Iron

(c) Magnesium

(d) Platinum

22. In the laboratory process, ammonia is produced by heating of excess slaked lime and -------.

(a) ammonium nitrate

(b) ammonium chloride

(c) ammonium sulphate

(d) ammonium acetate

23. Ammonia is ---- than air.

(a) lighter

(b) heavier

(c) neither lighter nor heavier

(d) either lighter or heavier

24. Ammonia is a ---- gas.

(a) yellow

(b) pink

(c) white

(d) colourless

25. Ammonia gas is soluble in water and produces ----- .

(a) weak acid

(b) weak alkali

(c) weak salt

(d) weak nitrate

26. Solubility of ammonia in water was shown by ---- experiment.

(a) Frasch experiment

(b) Haber experiment

(c) Fountain experiment

(d) Reduction experiment

27. Ammonia is used for which of the mentioned processes?

(a) Manufacture of nitrogen fertilizer

(b) Manufacture of nitric acid

(c) Manufacture of nitrogen chemical compounds

(d) All of above

28. What is the temperature at which the preheated gas flows through the inside of the tube, which contains a promoted iron catalyst?

(a) 300 °C

(b) 400 °C

(c) 680 °C

(d) Above 1000 °C

29. Which of the following mentioned is a source of H_2 to produce ammonia by Haber's process?

(a) from ethanol production

(b) produce with platinum catalyst

(c) from neutral gas

(d) none of the above

30. Why ammonia gas is not collected over water?

(a) Ammonia is heavier than air

(b) Ammonia is pungent smell

(c) Ammonia and water were same properties

(d) Ammonia is soluble in water

31. How is ammonia gas dry?

(a) By heating

(b) By conducting with sulphuric acid (drying agent)

(c) By conducting with anhydrous calcium chloride

(d) By passing the drying agent quick lime (CaO)

32. Ammonia combines directly with some metals on heating. Thus, dry ammonia passed over sodium metal heated to red heat forms -----.

(a) sodamide

(b) sodium ammonium nitrate

(c) sodium nitrate

(d) $NaNH_3$

33. Sodium amide are hydrolysed by water

(a) $NaNH_2(s) + H_2O(l) \rightarrow NaOH(aq) + N_2(g)$

(b) $NaNH_2(s) + H_2O(l) \rightarrow Na(aq) + NH_3(g)$

(c) $NaNH_2(s) + H_2O(l) \rightarrow NaOH(aq) + NH_3(g)$

(d) $NaNH_2(s) + H_2O(l) \rightarrow Na(NH_4OH)(aq)$

34. Nitric acid is also known as ------ is a more common and highly corrosive mineral acid.

(a) aqua regia

(b) aqua fortis

(c) aqua mineral

(d) aqua marine

35. Nitric acid is manufactured by ---

(a) contact process

(b) ammonia oxidation process

(c) Frasch process

(d) Haber process

36. In ammonia oxidation process, the catalyst starts glowing red even though no external heat is applied in the reaction because ----
    (a) the reaction not required heat
    (b) the reaction is exothermic and maintains the reaction temperature
    (c) the reaction is require pressure only
    (d) the reaction is endothermic and require heat absorbed from the surrounding

37. Nitric acid is ---
    (a) fuming liquid
    (b) oily liquid
    (c) viscous liquid
    (d) milky liquid

38. When reactive metals react with nitric acid hydrogen gas is produce but less reactive metals such as zinc or aluminium react with nitric acid, --- is produced.
    (a) hydroxide
    (b) ammonium nitrate
    (c) carbon dioxide
    (d) nitrosyl chloride

39. Aqua regia means ---
    (a) 1 volume of hydrochloric acid and 1 volume of sulphuric acid
    (b) 3 volume of concentrated hydrochloric acid and 1 volume of dilute any acid
    (c) 3 volume of concentrated hydrochloric acid and 1 volume of concentrated nitric acid
    (d) 3 volume of concentrated sulphuric acid and 3 volume of concentrated sulphuric acid

40. Noble metal gold is dissolved in aqua regia to liberate gold III chloride. It was dissolved in excess hydrochloric acid to form chloroauric acid -----.
    (a) ClAu
    (b) $AuCl_2$
    (c) $HAuCl_4$
    (d) $H_2Au_2Cl_2$

41. There are three allotropes of sulphur. Two of which are ---- form
    (a) amorphous
    (b) crystalline
    (c) plastic
    (d) liquid

42. One of the metal ores that are the source of sulphur –
    (a) iron pyrites (FeS)
    (b) Chile saltpeter ($NaNO_3$)
    (c) Bauxite ($Al_2O_3.2H_2O$)
    (d) Cryolite (Na_3AlF_6)

43. Sulphur, which is deposited at about 700 ft (~213 m) below the Earth's surface, is mined or extracted by the ---- Process.
    (a) contact process
    (b) ammonia oxidation process
    (c) Frasch process
    (d) Haber process

44. Since sulphur has 6 electrons in the outermost shell, the oxidation numbers of sulphur vary from ---
    (a) +1 to +6
    (b) -2 to +6
    (c) +2 to +6

(d) -1 to +6

45. the oxidation number of sulphur in H_2SO_3 is ---

(a) +1

(b) +2

(c) +3

(d) +4

46. Sulphur dioxide gas is ---- soluble in water.

(a) not

(b) slightly

(c) moderately

(d) very

47. What are allotropes?

(a) substances made out of atoms of the same element, but in different structures

(b) atoms with the same number of protons, but different numbers of neutrons

(c) substances made of atoms of different elements with similar structures

(d) atoms with the same number of neutrons, but different numbers of protons

48. Sulphur dioxide is used in the production of one of these.

(a) crude oil

(b) ore

(c) perfume

(d) food preservative

49. Hydrogen sulphide is ---- gas.

(a) laughing

(b) natural

(c) poisonous

(d) sweetish

50. Sulphuric acid is manufactured by the -----

(a) contact process

(b) ammonia oxidation process

(c) Frasch process

(d) Haber process

51. The dry sulphur dioxide and excess of air can react directly.

(a) No! it is need catalyst only

(b) No! it is need heat only

(c) No! it is need heat and catalyst

(d) No! it is need mechanical helping

52. At room temperature and pressure, sulphuric acid is

(a) colourless, oily, dense solid

(b) colourless, oily, heavy liquid

(c) colourless, oily, sweetish smell, volatile liquid

(d) dark brown gas

53. Sulphuric acid can absorb not only free water, such as moisture so it can be used as

(a) fire extinguisher

(b) cooling agent

(c) dehydrating agent

(d) fuel additive

54. The following production can not be use sulphuric acid

(a) superphosphate

(b) dry ammonia

(c) ammonium sulphate

(d) lead-storage batteries

Chapter VI

Section B

1. The following questions relate to the gases: nitrogen, nitrogen oxide, dinitrogen oxide, and nitrogen dioxide.
   (a) Which gas(es) is(are) acidic oxide(s)? (b) Which gas can be manufactured from liquid air by fractional distillation?
   Choose the correct pair
   (A) (a) Nitrogen oxide (b) Dinitrogen oxide
   (B) (a) Nitrogen dioxide (b) Nitrogen
   (C) (a) Dinitrogen oxide (b) Nitrogen oxide
   (D) (a) Nitrogen (b) nitrogen dioxide

2. In the ammonia oxidation process the following conditions were required
   (A) Catalyst platinum and rhodium and heat about 800 °C
   (B) Catalyst iron and heat about 450 °C
   (C) Catalyst platinum or vanadium(V) oxide and heat about 400 to 500 °C
   (D) Catalyst nitrogen dioxide and heat at room temperature

3. At room temperature, a sample of NO_2 gas is brown.
   This NO_2 gas loses its color as when it is cooled. Why?
   (A) It absorbs water from the air when it is cooled
   (B) It absorbs heat from the atmosphere when it is cooled.
   (C) Nitrogen oxide changes to dinitrogen tetroxide when it is cooled.
   (D) Nitrogen oxide changes to nitrogen dioxide when it is cooled.

4. Describe the temperature, pressure, and catalysts on the Haber process for the production of ammonia.
   (A) The mixture of nitrogen and hydrogen is passed over an iron catalyst at a high pressure of about 200 atm and a moderately high temperature of 450 °C.
   (B) The mixture of nitrogen and hydrogen is passed over vanadium(V) oxide catalyst at a high pressure of about 500 atm and a moderately low temperature of 23 °C.
   (C) The mixture of nitrogen and hydrogen is passed over vanadium(V) oxide catalyst at a low pressure of about 10 atm and a moderately high temperature of 700 °C.
   (D) The mixture of nitrogen and hydrogen is passed over an iron catalyst at a high pressure of about 2000 atm and a moderately high temperature of 750 °C.

5. Ammonia has the following general properties as a gas; and the main purpose of industrial manufacture of ammonia to make ----
   (A) colourless, distinctive smell, less dense than air and soluble in water – agricultural fertilisers
   (B) colourless, sweetish smell, heavier than air and acidic properties in water – narcotic drug
   (C) light blue, pungent smell, same relative mass as air, basic properties in water – solar cell
   (D) colourless, no smell, less dense than air and insoluble in water – agriculture pesticide

6. Ammonia reacts with chlorine, two forms of chemical reaction can occur. If ammonia is excess ---- can form and if chlorine is excess --- will form.
   (A) ammonium chloride, nitrogen
   (B) nitrogen, chlorine
   (C) nitrogen, nitrogen trichloride

(D) nitrogen dioxide, nitric acid

7. Nitric acid stored in brown glass bottles because ----
   (A) it was produced fluorescent light
   (B) it was reacted with white glass bottles
   (C) it is subject to heat or light, decomposition occurs
   (D) it is absorbed ultra violet light and explosive occur

8. Dilute nitric acid is reacted with potassium hydroxide and we can call the reaction is ---- and chemical reaction is ---
   (A) combustion reaction, $HNO_3(aq) + KOH(aq) \rightarrow K_2O(aq) + H_2O(aq)$
   (B) neutralization reaction, $HNO_3(aq) + KOH(aq) \rightarrow KNO_3(aq) + H_2O(aq)$
   (C) decomposition reaction, $HNO_3(aq) + KOH(aq) \rightarrow K(s) + NO_3(aq) + H_2O(aq)$
   (D) synthetic reaction, $HNO_3(aq) + KOH(aq) \rightarrow KNO_3(aq) + H_2O(aq)$

9. Differences between the isotopes and allotropes of elements are
   (A) Isotopes are different numbers of electrons and allotropes are different numbers of neutrons
   (B) Isotopes are different numbers of neutrons and allotropes are different form of same elements
   (C) Isotopes are different form of structure and allotropes are different state
   (D) Isotopes are different numbers of protons and allotropes are different number of neutrons

10. Sulphur dioxide bleaches colouring matter by reduction such as violet colour acidified potassium permanganate to ----- and orange colour acidified potassium dichromate solution to -----.
   (A) colourless, green
   (B) colourless, colourless
   (C) colourless, black

(D) black, black

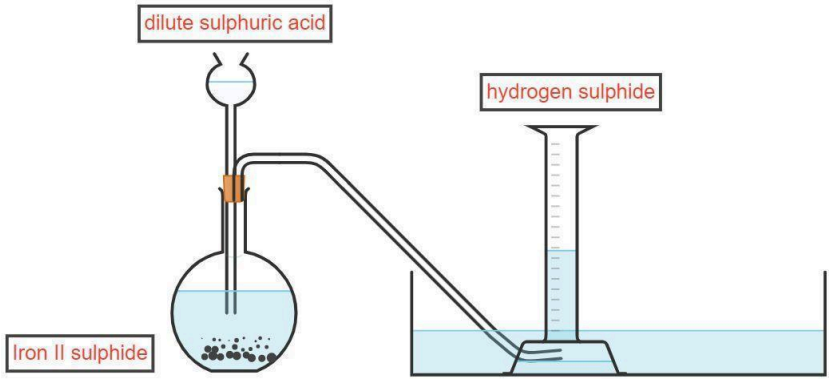
11. In the sulphuric acid production, the gas mixture, SO_2 and excess air, contains impurities. So it is needed to pass ----- and if impurities are left, these impurities -----.
    (A) spraying tower, reduce the concentration of sulphuric acid
    (B) wash tower, poison the catalyst
    (C) catalytic converter, dirty the sulphuric acid
    (D) separating tower, reduce the acid

12. Sugar, starch and other carbohydrates are dehydrated by concentrated sulphuric acid. The example reaction is
    (A) $12C(s) \xrightarrow{conc.\ H_2SO_4} C_{12}H_{22}O_{11}(s) + H_2O(l)$
    (B) $C_{12}H_{22}O_{11}(s) \xrightarrow{conc.\ H_2SO_4} 12C(s) + 11H_2O(l)$
    (C) $NaCl(s) \xrightarrow{conc.\ H_2SO_4} 12Na(s) + 11H_2O(l)$
    (D) $CuSO_4(s) \xrightarrow{conc.\ H_2SO_4} Cu(s) + H_2O(l) + SO_4(aq)$

13. What happens when sodium amide reacts with water?
    (A) $NaNH_2(s) + H_2O(l) \rightarrow NaOH(aq) + NH_3(g)$
    (B) $Mg_3N_2(s) + 6H_2O(l) \rightarrow 3Mg(OH)_2(s) + NH_3(g)$
    (C) $2NO_2(g) + H_2O(l) \rightarrow HNO_3(aq) + HNO_2(aq)$
    (D) $SO_2(g) + H_2O(l) \rightarrow H_2SO_4(aq) + 2[H]$

14. Oleum is an intermediate product in the industrial manufacture of sulphuric acid. How oleum converted into sulphuric acid.
    (A) $H_2S_4O_7(l) + H_2O(l) \rightarrow 2H_2SO_4(l)$
    (B) $H_2S_2O_7(l) + H_2O(l) \rightarrow 2H_2SO_4(l)$
    (C) $H_7S_2O_2(l) + H_2O(l) \rightarrow 2H_2SO_4(l)$
    (D) $H_2S_2O_2(l) + H_2O(l) \rightarrow 2H_2SO_4(l)$

15. This setup below is use to prepare hydrogen sulphide gas.



Identify the mistake the setup

(A) no heat, incomplete chemical

(B) hydrogen sulphide gas is soluble in water so it cannot be collect downward displacement of water

(C) collect hydrogen sulphide need hot water, in this figure uncertain hot water or cool water

(D) all flasks are very small and heat is required for preparation of hydrogen sulphide

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Chapter VII

Section A

1. The Earth's atmosphere contains a mixture of several gases. its composition varies from time to time and from place to place but typical clean air contains about --- % of nitrogen.

   (a) 21 %

   (b) 0 %

   (c) 78 %

   (d) 0.03 %

2. The main composition of clean air is

(a) oxygen

(b) nitrogen

(c) helium

(d) carbon dioxide

3. The troposphere is the ---- layer of the atmosphere and contains about three-fourths of the gases of the atmosphere.

(a) lowest

(b) 2nd

(c) 3rd

(d) top

4. The gas temperature of the Troposphere is --- near the surface of earth. (a) cooler

(b) medium

(c) hotter

(d) same as another atmospheric layer

5. ---- layer is where we find the ozone layer.

(a) Troposphere

(b) Stratosphere

(c) Mesosphere
(d) Thermosphere

6. ---- layer that shields living creatures from life-destroying ultraviolet radiation.

(a) Tropopause

(b) Ozone

(c) Mesopause

(d) Thermosphere

7. The temperature of the stratosphere being warmer because of ---.

(a) jet aircraft fly in this layer

(b) spaceship work in this layer

(c) deposited the waste industrial gas in this layer

(d) absorbs most of the ultraviolet radiation from sunlight

8. The proportion of nitrogen to oxygen in the Mesosphere layer is about the --- as in the troposphere.

(a) more

(b) less

(c) same

(d) no nitrogen and oxygen in this layer

9. The most common way to fix nitrogen is by causing it to combine with oxygen.

(a) Lightning

(b) Fossil fuel combustion

(c) Forest fire

(d) Photosynthesis

10. Atmospheric nitrogen (N_2 gas) is easily taken up and used by plants and animals.

(a) Yes, it is easily combined with other elements

(b) Yes, plants can convert nitrogen to nutrient easily

(c) No, it is inert molecular nitrogen (N_2 gas)

(d) No, plants and animals not need nitrogen

11. Atmospheric nitrogen converted to nitrogenous compounds by bacteria is called ---

(a) nitrification

(b) denitrification

(c) neutralization

(d) nutrition

12. Which process releases dinitrogen gas (N_2) back into the atmosphere.

(a) Nitrification

(b) Denitrification

(c) Nitrogen fixation

(d) Neutralization

13. In the stratosphere, some oxygen converts to the ozone by using --- radiation.

(a) gamma

(b) alpha

(c) photon

(d) short wavelength ultraviolet

14. The atmosphere is about ---- percent of oxygen.

(a) 21

(b) 13

(c) 78

(d) None of above

15. Oxygen is used by both plants and animals in the process ---

(a) metabolism of foods

(b) decay and combustion of plants and animals

(c) in the form of oxide of nitrogen

(d) All of the above

16. The two forms of oxygen formed in the atmosphere are —

(a) water and oxygen

(b) oxygen and ozone

(c) water and ozone

(d) all of the above

17. The size of particles affected by the air pollution were ----- than human hair diameter.

(a) smaller

(b) bigger

(c) all of the above

(d) none of above

18.The air pollutants from the various sources were categorized as ---

(a) oxide of sulphur and organic compounds

(b) gaseous air pollutants and particulate pollutants

(c) smoke pollutants and smog pollutants

(d) sulphur pollutants and nitrogen pollutants

19.What is air pollution?

(a) The smell of rotten eggs.

(b) Releasing helium balloon

(c) A smell of dust bin

(d) Toxic substances in the air

20.Gaseous air pollutants (oxide of sulphur) were poisonous on ----

(a) elderly people

(b) animals

(c) plants

(d) all of above

21.Sulphur containing fossil fuel is burnt in air and produces oxide of sulphur which can cause -----.

(a) acid rain

(b) bed smell

(c) more nutrient to plants

(d) good for air quality

22.Which of these problems can be caused by air pollution immediately?

(a) Reduce food sources for humans

(b) Decrease global temperature

(c) Respiratory problem

(d) Migrate animals

23. High concentration of nitrogen oxide leads to

(a) oxygen deprivation
(b) irritant to the eyes and the respiratory system

(c) damage the leaves of plants and retard the rate of photosynthesis

(d) all of the above

24.Carbon monoxide is highly poisonous gas to living beings because

(a) ability to block the delivery of oxygen to the organs and tissues

(b) ability to increase the rate of reaction in organs

(c) ability to increase the body temperature

(d) ability to react with oxygen in the body and form carbon dioxide

25.the hydrogen sulphide (H_2S) gas given off by a volcanic eruption is oxidised by air, the chemical equation represented by

(a) $2H_2S\ (g) + 3O_2(g) \rightarrow 2SO_2(g) + 2H_2O\ (g)$

(b) $2H_2S\ (g) + 3O_2(g) \rightarrow H2_SO_4(l)$

(c) $2H_2S\ (g) + 3O_2(g) \rightarrow 2\ H_2S_2O_7(l)$

(d) $H_2S\ (g) + 3/2\ O_2(g) \rightarrow SO_2(g) + H_2O\ (g)$ 26.The formation of acid

26. Acid rain can be represented by equation as

(a) $SO_2(g) + O_2(g) + H_2O\ (l) \rightarrow H_2SO_4(aq)$

(b) $SO_2(g) + 2O_2(g) + H_2O\ (l) \rightarrow 2H_2SO_4(aq)$

(c) $SO_2(g) + ½\ O_2(g) + H_2O\ (l) \rightarrow H_2SO_4(aq)$

(d) $2SO_2(g) + O_2(g) + 2H_2O\ (l) \rightarrow 2H_2SO_4(aq)$

27.H_2S has been referred to as the ----- because inhalation of high concentrations can cause immediate loss of consciousness and death.

(a) laughing gas

(b) knock down gas

(c) biogas

(d) flue gas

28. Atomic oxygen can be produced by:

(a) $H_2O_2(l) \rightarrow H_2O(g) + O(g)$

(b) $NO_2(g) \xrightarrow{h\nu} NO(g) + O(g)$

(c) $NO_2(g) \xrightarrow{\text{heat}} NO(g) + O(g)$

(d) $NO_2(g) \xrightarrow{\text{catalyst/other energy}} NO(g) + O(g)$

29.Indoor concentrations of ozone are usually lower than outdoor concentrations.

(a) Yes, because ozone gas does not enter indoors.

(b) Yes, because without sunlight, ozone does not form indoors.

(c) No, there is the same amount of ozone in indoor and outdoor.

(d) No, concentrations of ozone levels indoors are higher than outdoor concentrations.

30.Ground-level ozone pollution is

(a) harmful to people with asthma

(b) harmful to athletes

(c) harmful to animals and plants

(d) all of the above

31.High ozone pollution levels are most likely to occur during

(a) cold, rainy days

(b) cool, windy nights

(c) hot, sunny days

(d) all of above

32.Methane is indeed a greenhouse gas. Methane has a high global warming potential

and contributes significantly to climate change because

(a) It has a direct influence on climate

(b) It is as an important precursor to the formation of tropospheric ozone

(c) It is more effective at trapping infrared radiation

(d) All of above

33. Volatile Organic Compounds (VOCs) have a ---- boiling point and --- melting point which allows molecules to change phase easily at room temperature.

(a) low, low

(b) high, low

(c) low, high

(d) high, high

34. Substance(s) that qualify to be called particulate air pollutants include

(a) smoke

(b) ash

(c) dust

(d) all of above

35. Which of the following pollutants are responsible for the cause of SMOG?

(a) From incinerators

(b) Emissions from vehicles

(c) Both incinerators and vehicles

(d) None of above

36. Which of the following particles are called particulate pollutants?

(a) Ozone

(b) Radon

(c) Fly ash

(d) Ethylene

37.Radon gas is inert, colourless and odourless gas and it is occurred in ---.

(a) naturally

(b) laboratory

(c) cave

(d) river

38.Sulphurous smog is caused by the combustion of ------.

(a) wood

(b) pozoland

(c) sulphur bearing fossil fuels

(d) hydrogen fuel

39. ----- usually form from the action of sunlight on unsaturated hydrocarbons and oxides of nitrogen produced by automobiles and factories.

(a) fuel smog

(b) sulphurous smog

(c) photochemical smog

(d) nitrogen smog

40.The rain water is acidic when the pH value is drop below -----.

(a) 7

(b) 8

(c) 6.6

(d) 5.6

41. The depletion of the protective ozone layer could occur due to the present of ----- in the stratosphere.

(a) water

(b) oxygen

(c) ozone

(d) oxide of nitrogen

42.Freons is a ----- and it is the main sources of ozone depletion materials.

(a) oxide of nitrogen

(b) chlorofluorocarbons

(c) organic matter

(d) chlorine compounds

43.Excessive richness of nutrients in a lake and other body of water can be called -----.

(a) feedlots

(b) turbidity

(c) eutrophication

(d) acclimation

44.Monitoring air quality has become very important to pollution detection. This statement is

(a) Yes, it can control the air quality of industry zones.

(b) Yes, it can help to control air pollution and eventually improve air quality.

(c) No, it will control the development of industry

(d) No, monitoring sensors are very expensive and may need to be calibrated periodically to maintain accuracy.

45.Clouds are present in

(a) Stratosphere

(b) Troposphere

(c) Mesosphere

(d) Thermosphere

46.Which of the following gases can deplete the upper atmosphere's ozone layer?

(a) Ammonia

(b) Carbon monoxide

(c) Methane

(d) Sulphur dioxide

47. Effects of air pollution include

(a) Increase incidence of heart attacks, cancer and respiratory diseases

(b) Disruption of aquatic food chains and fish reproduction

(c) Death of forests

(d) All of above

48.Which of the following particles is called the particulate pollutants?

(a) Ozone

(b) Radon

(c) Fly ash

(d) Ethylene

49.The major photochemical smog is ----

(a) Hydrogen peroxide

(b) Chlorofluorocarbon

(c) Peroxyacetyl nitrate

(d) All of the above

50. The largest quantities of carbon dioxide are put into the atmosphere from (a) Natural tree growth

(b) Burning fossil fuels

(c) Manufacturing facilities

(d) All of the above are correct