CHRIST HIGH SCHOOL

CHRIST HIGH SCHOOL PLOT 5, CHS STREET, KM 32, ABUJA-KEFFI ROAD UKE, NASARAWA STATE

SECOND TERM EXAMINATION 2024/2025 ACADEMIC SESSION

SUBJECT: chemistry
SECTION: 2024/2025
CLASS: SS2
TIME: 2hours 30minutes

NAME……

CANDIDATE'S ADMISSION NO.

INSTRUCTION

Write your name and number in the space provided on your answer booklet. Write your name on any extra sheet used.

Answer all questions in Part A and four in Part B.

At the end of the examination, staple all your work securely together.

FOR EXAMINER'S USE	
Total Score:	+

1. Which of the following elements would form an ionic compound with hydrogen?
   a. $_{6}C$
   b. $_{7}N$
   c. $_{11}Na$
   d. $_{17}Cl$
   e. $_{2}He$
2. The extraction of Sulphur from the earth crust can be done by the ------- process
   A. Bosc
   B. Contact
   C. Frasch
   D. Haber
   E. Solvay
3. Sulphur burns in air to form
   A. An acidic oxide
   B. A basic oxide
   C. An amphoteric oxide
   D. A neutral oxide
   E. A mixed oxide
4. Hydrogen is prepared industrially from water gas. This method is called ……
   A. Haber process
   B. Solvay process
   C. Contact process
   D. Frasch process
   E. Bosch process
5. Which of the following phenomena is not caused by air pollution?
   A. Depletion of ozone layer
   B. Nitrogen fixation
   C. Acid rain
   D. Greenhouse effect
   E. None of the above
6. Which of the following gas is less dense than air?
   A. NH_3

B. CO_2
C. SO_2
D. HCl
E. H_2O

7. Which of the following equations represent the laboratory preparation of hydrogen?
A. $C_{(S)}+H_2O_{(l)}\rightarrow CO_{(g)}+ H_{2(g)}$
B. $Cu_{(S)}+ H_2O_{(l)}\rightarrow CuO_{(S)}+ H_{2(g)}$
C. $2Al_{(s)}+3H_2O_{(l)}\rightarrow Al_2O_{3(s)}+ H_{2(g)}$
D. $Zn_{(s)}+2HCl_{(aq)}\longrightarrow ZnCl_{(aq)}+H_{2(g)}$
E. $CH_{4(g)}+H_2O\longrightarrow CO_{(g)}+3H_{2(g)}$

8. How many isotopes has hydrogen?
A. 2
B. 3
C. 4
D. 5
E. 6

9. Hydrogen is readily released when dilute hydrochloric acid reacts with
A. Ag
B. Au
C. Cu
D. Zn
E. Pb

10. One of the Isotopes of hydrogen is _____
A. ozone
B. deuterium
C. diamond
D. graphite
E. rhombic sulphur

11. The gas given out when sodium reacts with water is.....
A. oxygen
B. nitrogen
C. hydrogen
D. Chlorine
E. steam

A.

12. Oxygen is prepared by heating.

A. Na_2CO_3
B. $KClO_3$
C. K_2SO_4
D. H_2S
E. H_2O

13. Which of the following element will burn in excess oxygen to form a product that is neutral to litmus?

A. Carbon
B. lithium
C. sulphur
D. sodium
E. hydrogen

14. Chlorine water is used as a bleaching agent because it is

A. an acidic solution
B. an alkaline solution
C. an oxidizing agent
D. a reducing agent
E. a halogen

15. Which of the following statements about chlorine and iodine at room temperature is correct?

A. Chlorine is gas and iodine is solid
B. Chlorine is liquid and iodine is gas
C. Chlorine and iodine are gasses
D. Chlorine is solid and iodine is liquid
E. Both chlorine and iodine are liquid

16. Which of the following gases will bleach moist litmus paper?

A. CO_2
B. H_2
C. SO_2
D. HCl
E. Cl_2

17. Zinc oxide is amphoteric because it

A. forms an acid salt
B. Is an insoluble base

C. Forms a double salt
D. Reacts with a base or an acid
E. Forms a basic salt

18. Which of the following substances is a peroxide?
A. Na_2O_2
B. CuO
C. Pb_2O_4
D. Fe_2O_3
E. Na_2O

19. which of the following gas is poisonous and when inhaled in quantities can cause damage to the lungs?
A. Chlorine gas
B. Hydrogen gas
C. Oxygen gas
D. Ammonia gas
E. Nitrogen gas

20. Hydrogen is used for the following except
A. manufacture of ammonia
B. extinguishing fire
C. manufacture of margarine
D. synthesis of hydrochloric acid
E. filling of balloons

21. which of the following gases is the lightest?
A. O_2
B. SO_2
C. H_2
D. co_2
E. Cl_2

22. which of these is not a constituent of air?
A. water vapour
B. nitrogen
C. oxygen
D. iron
E. carbon (Iv) oxide

23. oxygen occupies what percentage of the air?
A. 21%

B. 30%
C. 78%
D. 0.03%
E. 15%

24. which of these is a neutral oxide?

A. CaO
B. PbO
C. H_2O
D. k_2O
E. Al_3O

25. Which of the halogens is radioactive?

A. Chlorine
B. Fluorine
C. Astatine
D. Iodine
E. Bromine

26. Chlorine is used in water treatment as

A. A decolourizing agent
B. A Germicide
C. An antioxidant
D. A coagulating agent
E. An aerating agent

27. Halogens generally react with metals to form

A. Alkalis
B. Acids
C. Bases
D. Salts
E. Water

28. Fluoride ions are sometimes added in the treatment of town water supply to

A. Improve coagulation
B. Kill germs and bacteria
C. Prevent tooth decay
D. Speed up sedimentation
E. Add taste to the water

29. Which of the halogens is poisonous with irritating smell?

A. Iodine
B. Fluorine

C. Chlorine
D. Bromine
E. Astatine

30. Bromine is …….. in colour
A. Reddish brown
B. Yellowish brown
C. Pale green
D. Pale yellow
E. Violet

31. Nitrogen is prepared on large scale by the
A. Decomposition of ammonium dioxonitrate III
B. Electrolysis of brine
C. Haber process
D. Fractional distillation of liquefied air
E. Contact process

32. Ammonia is suitable for performing the fountain experiment because the gas is
A. Colourless
B. A cooling agent
C. Alkaline to litmus
D. Very soluble in water
E. Sparingly soluble in water

33. On a large scale hydrogen is produced from _____
A. producer gas
B. water gas
C. coke
D. coal tar
E. air

34. the flame used by welders in cutting metals is
A. acetylene
B. butane gas
C. kerosene flame
D. oxy-acetylene flame
E. oxygen flame

35. which of these is a reason why chlorine does not bleach printers ink?
A. Because it is an oxidizing agent

B. Because it is a reducing agent
C. Because it is a halogen
D. Because it contains calcium
E. Because it contains carbon

36. $Cl_{2(g)}+2NaBr_{(s)}\longrightarrow 2NaCl_{(aq)}+Br_{2(g)}$
This equation represents
A. Oxidizing nature of chlorine
B. Displacement reaction of chlorine
C. Combustion of chlorine
D. Bleaching action of chlorine
E. Reaction of chlorine with alkalis

37. What is the product formed when chlorine reacts with slaked lime?
A. Face powder
B. Bleaching cream
C. Oxidizing powder
D. Bleaching powder
E. Chlorine water

38. Which of the following halogens is liquid at room temperature?
A. Chlorine
B. Iodine
C. Fluorine
D. Bromine
E. Astatine

39. In the laboratory preparation of chlorine, the gas is passed through water before collection so as to
A. Remove unoxidized hydrogen chloride gas
B. Cool the chlorine gas
C. Enable the gas to be diluted
D. Increase the volume of chlorine gas
E. Remove manganese (iv) oxide

40. Iodine at room temperature is solid and not gas because of
A. Covalent bonding between the atoms of iodine
B. electrovalent bonding between the atoms of iodine
C. hydrogen bonding which occurs in the solid state
D. metallic bonding which occurs only in the solid state
E. van der waals forces between the iodine molecule

41. chlorine is best collected

A. by downward displacement of air
B. by upward displacement of air
C. inside water
D. over mercury
E. over water

42. the oxidation states of chlorine in HOCl and $HClO_3$ are …….. and …… respectively
A. -3, -7
B. -1, -5
C. -1, +5
D. +1, +5
E. +3, +7

43. Nitrogen combines with metals to form
A. Halides
B. Hydrides
C. Oxides
D. Chlorides
E. Nitrides

44. In the laboratory preparation of oxygen dry oxygen is usually collected over
A. Hydrochloric acid
B. Mercury
C. Calcium chloride
D. Tetraoxosulphate VI acid
E. Water

45. 2,8,7 is the electronic configuration of
A. F
B. I
C. Br
D. Cl
E. At

46. In the Haber process for the manufacture of ammonia, the catalyst commonly used is finely divided.
A. vanadium
B. platinum
C. iron
D. copper

E. nickel

47. Which of the following gases makes up the largest percentage of the atmospheric air?

A. Carbon (IV) oxide
B. Hydrogen
C. Nitrogen
D. Noble gases
E. Oxygen

48. Which of the following shows the order of decreasing reactivity of the halogens?

A. $F_2>Cl_2>Br_2>I_2$
B. $Cl_2>F_2>Br_2>I_2$
C. $Br_2>F_2>I_2>Cl_2$
D. $Br_2>Cl_2>F_2>I_2$
E. $Cl_2>I_2>F_2>Br$

49. Which of the following is also referred to as laughing gas?

A. NO
B. NO_2
C. N_2O
D. N_2O_2
E. N_2O_4

50. A brown ring observed at the junction of a test tube layer indicates the presence of

A. Trioxonitrate (v)
B. Ammonia
C. Chlorine
D. Tetraoxosulphate (vi)
E. Bromine

SECTION B: THEORY

Answer any Four Questions

1. (a) Write the formula of the oxide of nitrogen in which nitrogen has oxidation number of (i) +1 (ii) +2 (iii) +3 (iv) +4 (**12marks**)

(b)state which of the oxides in (a) above is/are

(i) neutral

(ii) acidic **(4marks)**

c. State the reason why glasses apparatus must be used for the laboratory preparation of concentrated trioxonitrate (v) acid **(5marks)**

(d)(i) with the aid of an equation only, describe a chemical test for ammonia using concentrated hydrochloric acid **(4marks)**

TOTAL MARKS= (25 MARKS)

2(a)i. explain why trioxonitrate (v) acid is not used in the laboratory preparation of hydrogen **(4marks)**

ii. list two (2) substances that can be used in the laboratory to dry hydrogen **(2marks)**

b. Mention the isotopes of hydrogen and give their chemical symbol **(6marks**)

c. with the aid of an equation, explain four (4) chemical properties of hydrogen **(8marks)**

(d) (i) _ describe briefly, one chemical test for hydrogen gas in the laboratory **(5 marks)**

TOTAL MARKS= (25 MARKS)

3. (a). give three uses of chlorine **(3 marks)**

Bi. draw a well labelled diagram for the laboratory preparation of a dry sample of chlorine **(5marks)**

(ii) State the action of chlorine on moist blue litmus paper. **(2 marks)**

c. state the type of reaction involved between chlorine and

(i) sodium iodide (ii) iron (ii) chloride (iii) sodium hydroxide (**6marks**)

D(i) write an equation for each reaction in (c) above (**6marks**)

d(ii) mention three uses of iodine (**3marks**)

TOTAL MARKS= (25 MARKS)

4. (a)i State the two main processes involved in the industrial manufacture of oxygen from air **(4 marks)**

(ii) name the type of chemical bonding which exists between oxygen atoms in a molecule of oxygen (**3marks**)

b(i) what is an amphoteric oxide? (**4marks)**
(ii) give an example of an amphoteric oxide and write two equations to show its amphoteric nature. (**5mark**)
c. classify each of the following oxides as basic, amphoteric, acidic or neutral
(i) carbon (ii) oxide
(ii) Sulphur(iv) oxide
(iii) aluminium oxide
(iv) calcium oxide
(v) water
(vi) carbon (iv) oxide
(**6 marks**)
d. state three physical properties of oxygen (**3 marks**)

TOTAL MARKS= (25 MARKS)

5 a(i). Describe the manufacture of Sulphur by the frasch process. (**4marks**)
(ii) what is the name of the process used for the industrial preparation of tetraoxosulphate (vi) acid? **(2 marks)**
iii) state the catalyst used in 5(a)ii**(2 marks)**

bi. Define the term allotropy. **(3marks)**

(ii). name the allotropes of Sulphur (**4marks)**

c(i). state four (4) physical properties of sulphur **(4marks**)
(ii) Mention two (2) ways of preventing rusting. **(4marks**)
(**2marks**)

TOTAL MARKS = 25 MARKS

6a(i) state three uses of nitrogen **(6marks)**
(ii) name the process used in the commercial production of ammonia **(2 marks)**
iii) using spdf, write the electronic configuration of chlorine and fluorine **(4 mark**
(b) (i)what term is used to describe the relationship between oxygen and ozone (**2 mark)**
(ii). differentiate between rusting and combustion **(4marks**)
C(i) if the solubility of KNO_3 is 0.20mol/dm^3 at room temperature. Calculate the mass in grams of KNO_3 in 250cm^3 of solutions (KNO_3 = 101g/mol) **(5marks)**
ii. Define flame **(2marks)**