KITH & KIN INTERNATIONAL COLLEGE

*7/11 Kaoli Olusanya Street, Owode Ibeshe, Ikorodu, Lagos State.*

**THIRD TERM EXAMINATION 2024/2025 ACADEMIC SESSION**

| **NAME** |  |
| --- | --- |
| **SUBJECT** | **CHEMISTRY** | **CLASS** | **SS1** | **DURATION** |  **2 HOURS** |

**SECTION A: OBJECTIVE [20 marks]**

INSTRUCTION: ***Each question is followed by four options lettered A to D. Find the correct option for each question and shade in pencil on your answer sheet, the answer space which bears the same letter as the option you have chosen.***

1. Which of the following is a compound?
A. Air
B. Water
C. Iron
D. Soil



1. The diagram above is best used for separating
A. salt from water
B. water and oil
C. components of dye
D. sand and ammonium chloride
2. Which of the following is a homogeneous mixture?
A. Sand and salt
B. Oil and water
C. Salt solution
D. Granite
3. Which of the following represents a chemical change?
A. Melting of ice
B. Boiling of water
C. Dissolving sugar in water
D. Rusting of iron
4. The smallest particle of an element that takes part in a chemical reaction is:
A. Molecule
B. Ion
C. Atom
D. Proton
5. The number of protons in an atom is its:
A. Mass number
B. Atomic number
C. Isotope number
D. Atomic mass
6. What is the atomic number of an element with 11 protons and 12 neutrons?
A. 11
B. 12
C. 22
D. 23
7. Which of the following is a noble gas?
A. Oxygen
B. Nitrogen
C. Argon
D. Hydrogen
8. Isotopes of an element have the same:
A. Number of neutrons
B. Mass number
C. Number of protons
D. Atomic mass
9. What is the mass number of an atom that has 20 protons and 22 neutrons?
A. 20
B. 22
C. 42
D. 2
10. Calculate the number of moles in 11g of carbon dioxide (CO₂). [Molar mass = 44 g/mol]
A. 0.25 mol
B. 0.5 mol
C. 1.0 mol
D. 2.0 mol
11. What is the molar mass of H₂SO₄?
A. 98 g/mol
B. 49 g/mol
C. 80 g/mol
D. 100 g/mol
12. The formula for calculating number of moles is:
A. Moles = Mass × Molar mass
B. Moles = Mass ÷ Molar mass
C. Moles = Volume × Molar mass
D. Moles = Mass + Molar mass
13. The molar volume of a gas at STP is:
A. 24.0 dm³
B. 22.4 dm³
C. 20.0 dm³
D. 18.0 dm³
14. What is the empirical formula of a compound with C = 40%, H = 6.67%, O = 53.33%?
A. CHO
B. C₂H₄O₂
C. CH₂O
D. C₂H₆O
15. The molecular formula of a compound is always a multiple of its:
A. Isotopic formula
B. Molecular weight
C. Empirical formula
D. Atomic number
16. In the reaction 2H₂ + O₂ → 2H₂O, the mole ratio of H₂ to O₂ is:
A. 1:1
B. 1:2
C. 2:1
D. 2:2
17. Which of the following is NOT a separation technique?
A. Filtration
B. Distillation
C. Condensation
D. Chromatography
18. The gaseous state of matter is best described as:
A. Fixed volume and shape
B. Fixed shape but variable volume
C. Variable shape and volume
D. Fixed shape and volume
19. Which gas law states that pressure is inversely proportional to volume?
A. Boyle’s law
B. Charles’ law
C. Avogadro’s law
D. Dalton’s law
20. According to Charles’ law, at constant pressure, the volume of a gas is directly proportional to its:
A. Mass
B. Pressure
C. Temperature
D. Density
21. A mixture is best defined as:
A. A combination of elements chemically
B. A compound of two or more elements
C. A combination of substances physically
D. A pure substance
22. What is the pH of a neutral solution?
A. 0
B. 7
C. 14
D. 1
23. Which of the following is a base?
A. NaCl
B. HCl
C. NaOH
D. H₂SO₄
24. Which of the following is a salt?
A. NaOH
B. HCl
C. NaCl
D. NH₃
25. Which of the following is a hydrocarbon?
A. CO₂
B. CH₄
C. NH₃
D. H₂O
26. Which of the following is an alkyne?
A. CH₄
B. C₂H₄
C. C₂H₂
D. C₆H₆
27. Which of the following oxides of carbon is poisonous?
A. CO
B. CO₂
C. H₂CO₃
D. Na₂CO₃
28. Which of the following is NOT a property of acids?
A. Turn blue litmus red
B. Have a sour taste
C. React with metals to give hydrogen
D. Turn red litmus blue
29. Coal is mainly composed of:
A. Nitrogen
B. Carbon
C. Oxygen
D. Hydrogen
30. What is the major component of natural gas?
A. Butane
B. Propane
C. Methane
D. Ethane
31. Which separation technique is used to obtain pure water from sea water?
A. Filtration
B. Distillation
C. Evaporation
D. Decantation
32. In the periodic table, elements are arranged in order of increasing:
A. Atomic mass
B. Atomic number
C. Mass number
D. Molar mass
33. The mass of one mole of hydrogen molecule is:
A. 1g
B. 2g
C. 4g
D. 0.5g
34. The molar mass of CaCO₃ is:
A. 40 g/mol
B. 60 g/mol
C. 100 g/mol
D. 44 g/mol
35. The major constituent of biogas is:
A. CO
B. CO₂
C. CH₄
D. H₂
36. What is the formula for ethene?
A. C₂H₆
B. C₂H₄
C. C₂H₂
D. CH₄
37. Which of these is a saturated hydrocarbon?
A. Ethyne
B. Ethene
C. Ethane
D. Benzene
38. Which of these is an allotrope of carbon?
A. CO
B. CO₂
C. Graphite
D. CaCO₃
39. Which of these fuels is the most environmentally friendly?
A. Petrol
B. Diesel
C. Natural gas
D. Coal
40. The atomic number of an element is equal to the number of:
A. Electrons only
B. Protons only
C. Protons and electrons
D. Neutrons only
41. If a sample contains 3 moles of oxygen gas, how many molecules are present? [Avogadro’s number = 6.02 × 10²³]
A. 6.02 × 10²³
B. 1.81 × 10²⁴
C. 3.01 × 10²³
D. 1.20 × 10²³
42. The correct IUPAC name for CH₃–CH₂–CH₃ is:
A. Propanol
B. Methane
C. Butane
D. Propane
43. What is the chemical formula of sodium carbonate?
A. Na₂CO₃
B. NaHCO₃
C. NaCO
D. Na₂CO₂
44. One mole of any gas at STP occupies:
A. 1 dm³
B. 11.2 dm³
C. 22.4 dm³
D. 33.6 dm³
45. What is the pH of a strong acid?
A. 1
B. 5
C. 7
D. 10
46. What is the volume occupied by 2 moles of gas at STP?
A. 11.2 dm³
B. 22.4 dm³
C. 44.8 dm³
D. 33.6 dm³
47. The simplest formula that gives the ratio of atoms in a compound is called:
A. Molecular formula
B. Structural formula
C. Empirical formula
D. Ionic formula
48. How many atoms are present in 1 mole of oxygen molecules?
A. 6.02 × 10²³
B. 3.01 × 10²³
C. 1.20 × 10²⁴
D. 2.01 × 10²³
49. Which of the following compounds contains ionic bonds?
A. H₂O
B. CO₂
C. NaCl
D. CH₄

**SECTION B: THEORY (40 marks)**

INSTRUCTION: Answer question number **1** and any other **three (3)** questions in this section. All questions carry equal marks.

1. (a)Define: i. acid ii. base iii. Salt (3 marks)

(b) Write the equation of reaction between HCl and NaOH. (2 marks)

(c) Name the first four alkanes. (2 marks)

(d) Calculate the mass of CO₂ produced when 16 g of methane is burnt completely.

(3 marks)

1. (a) Define matter and give two examples each of solid, liquid, and gas. (4 marks)

(b) Differentiate between physical and chemical changes and give examples. (2 marks)

(c) Explain the kinetic theory of matter. (2 marks)

(d) A gas occupies 500 cm³ at 27°C. What volume will it occupy at 127°C, if pressure is constant? (2 marks)

1. (a) Define element, compound, and mixture. (3 marks)

(b) Classify the following as element, compound, or mixture: NaCl, air, gold, water, bronze. (3 marks)

(c) Give two differences between compound and mixture. (2 marks)

(d) Write the chemical formula of a compound formed by aluminum and oxygen and calculate its molar mass. (2 marks)

1. (a) State two differences between filtration and distillation. (2 marks)

(b) Describe how to separate a mixture of salt, sand, and water. (3 marks)

(c) Why is chromatography useful in ink analysis? (2 marks)

(d) A mixture of 100g contains 25% salt and 75% sand. What is the mass of each component? (3 marks)

1. (a) Define empirical and molecular formula. (2 marks)

(b) A compound contains 40% C, 6.7% H and 53.3% O. Find its empirical formula.

(2 marks)

(c) If the molar mass is 180g/mol, what is the molecular formula? (2 marks)

(d) State Boyle’s law and Charles’ law. (4 marks)

1. (a) Define atomic number and mass number. (2 marks)

(b) What are isotopes? Give two examples. (2 marks)

(c) Calculate the number of protons, neutrons and electrons in Cl-37. (3 marks)

(d) The relative atomic mass of chlorine is 35.5. If Cl-35 and Cl-37 occur in the ratio 3:1, verify this. (3 marks)