

UMMUL QURA HIGH SCHOOL
AROWONA BUS-STOP, AMULOKO-AKANRAN ROAD, IBADAN.
2020/2021 SECOND TERM EXAMINATION

SUBJECT: Chemistry

DURATION : 2hrs : 30mins

CLASS: SS 1

INSTRUCTION: Answer *all* questions from part **A** and any *four* from part **B**

PART A

1. Which of the following is a *fine* chemical?
A. Fertilizer
B. Paint
C. Perfume
D. Cement
2. Which of the following is a *chemical change*?
A. Dissolving salt in water
B. Burning charcoal
C. Filtering a mixture of salt and sand
D. Magnetizing an iron nail
3. An *electron* is a
A. positively charged with no particle
B. particle with no charge
C. negatively charge with particle
D. particle found in the nucleus of the atom
4. The particle present in the *nucleus* of the atom is/are
A. the electron only
B. the electrons and protons only
C. the protons and neutrons only
D. the electrons, protons and neutrons
5. Water has a boiling point of 100⁰C, while ethanol has a boiling point of 78⁰C. Ethanol mixes with water *but* ethanol *does not* react with water.
- Ethanol can be effectively separated from ethanol/water mixture *by*
A. distillation
B. evaporation
C. fractional distillation
D. decantation
6. An atom of an element is represented by ${}_{15}^{32}x$; the number of *neutrons* present in the atom is
A. 15
B. 17
C. 47
D. 31
7. The percentage by mass of sulphur in **H₂SO₄** is (H = 1, S = 32, O = 16)
A. 63.30
B. 16.32
C. 8.16
D. 32.65
8. A hydrocarbon contains **75%** carbon, and **25%** hydrogen by mass. The empirical formula of the compound is
(C = 12, H = 1)
A. CH₄
B. C₂H₆
C. CH₃
D. C₂H₄
9. An atom or group of atoms that *possesses* an electric charge is *called*
A. Charge

- B. Ion
C. Nucleon
D. Radiation
10. Atomicity is the
A. number of atom in one element of molecule
B. number of element in one mole of compound
C. number of atoms in each molecule of an element
D. number of moles in an element
11. The relative molecular mass of sodium trioxocarbonate(IV), Na_2CO_3 is :
[Na = 23, C = 12, O = 16]
A. 74
B. 98
C. 40
D. 106
12. How many moles are there in **20g** of CuSO_4 ? (Cu = 64, S = 32, O =16)
A. 0.122 mol
B. 0.125 mol
C. 0.124
D. 0.104
13. The **sum** of the number of proton and neutron gives
A. Molar member
B. Atomic radius
C. Atomic munber
D. Mass number
14. The direct conversion of solid to gas is **termed**
A. Evaporation
B. Melting
C. Sublimation
D. Cracking
15. Four element **w, x, y** and **z** have atomic numbers 2, 6,16 and 20 respectively. Which of these elements is a **metal**?
A. X
B. Z
C. W
D. Y
16. The electronic configuration of an atom is 2, 8, 8, 2. the atomic number of the element is **therefore**
A. 10
B. 15
C. 18
D. 20
17. Which of the following **compounds** have the same molar mass?
[H =1, C =12, N =14, O =16, S =32, K =39, Ca =40, Cu =63]
I. CaCO_3
II. KHCO_3
III. $(\text{NH}_4)_2\text{SO}_4$
IV. CuSO_4
A. I and II only
B. II and III only
C. I, II and III only
D. I, II, III and IV only
18. What is the **mass** in grammes of 0.5 moles of oxygen atom? (O = 16)
A. 2.0g
B. 5.0g
C. 8.0g
D. 16.0g
19. How many atoms are there in **20moles** of calcium? (1 mole = 6.023 X 10^{23})
A. 12.046×10^{24}
B. 6.023×10^{22}
C. 12.046×10^{22}
D. 12.046×10^{23}

20. Concentrated tetraoxosulphate(VI) acid is described as a heavy chemical **because** it
- has a high molar mass
 - is a dense, oil liquid
 - is a powerful dehydrating agent
 - is used extensively and produced at a very large scale in industries
21. These are **examples** of chemical industries **except**
- Photosynthesis
 - Solvay process
 - Electrolysis of brine
 - Contact process
22. A **mixture** of NaCl and NH₄Cl is **best** separated by
- dissolution followed by friction
 - sublimation
 - dissolution followed by evaporation
 - dissolution followed by sublimation
23. A separating funnel is used in **separating** a mixture of
- liquid with different boiling points
 - sediments in a liquid
 - liquids that are immiscible
 - liquids with different colours
24. Which of the following atoms contains the **smallest** number of electrons in the **outermost shell**?
- ⁸O
 - ¹⁰Ne
 - ¹⁵P
 - ¹⁹K
25. The mass number of an element is 31. If its atomic number is 15, what is the composition of the nucleus of its atom?
- 15 electrons and 16 protons
 - 15 protons and 16 electrons
 - 15 protons and 16 neutrons
 - 15 neutrons and 16 protons
26. An atom with 19 protons, 19 electrons and 20 neutrons has a **mass number** of
- 39
 - 19
 - 38
 - 58
27. The following atoms of carbon ¹²₆C, ¹³₆C and ¹⁴₆C can be **described** as
- allotropes
 - isomers
 - isotopes
 - isotones
28. On **sublimation** of a mixture of common salt, sand and iodine, the sublimate **will** be
- sand
 - iodine
 - common salt
 - water vapour
29. The liquid part of a mixture which passes through a filter paper or porous material is **called**
- Solvent
 - Distillate
 - Filtrate
 - Residue
30. A good **example** of very important mixture is
- crude oil
 - chalk
 - clay
 - sand
31. Which of the following is **not** an element?
- Boron

- B. Calcium
C. Brass
D. Mercury
32. The latin *name* for *silver* is
A. Aurum
B. Argentums
C. Cuprum
D. Plumbum
33. The number of *atoms* in 5.85g NaCl is
A. 6.02×10^{22}
B. 5.85×10^{23}
C. 6.02×10^{24}
D. 5.85×10^{24}
34. A compound contains 36.4% sodium, 38.2% oxygen, and 25.4% sulphur. What is the *empirical formula* of the compound?
[Na = 23, O = 16, S = 32]
A. NaSO₄
B. Na₂SO₃
C. Na₂SO₄
D. Na₂S₂O₃
35. What is the percentage by *mass of copper* in copper (I) oxide (Cu₂O) ?
[O = 16, Cu = 64]
A. 88.9%
B. 80.0%
C. 66.7%
D. 20.0%
36. What is the number of oxygen atoms in 32g of the gas?
[O = 16, Avogadro's number = $6.02 \times 10^{23} \text{ mol}^{-1}$]
A. 3.2×10^{23}
B. 6.0×10^{23}
C. 1.2×10^{24}
D. 1.2×10^{23}
37. Which of the following is *a chemical change*?
A. Evaporation of sea water
B. Freezing ice cream
C. Melting of ice block
D. Slaking of lime
38. An impure water *has*
A. a boiling Point lower Than 100⁰C
B. a freezing point higher than 0⁰C
C. a lower density than 1gcm⁻³
D. a boiling point higher than 100⁰C
39. The purity of a solid sample can be *best* determined by its
A. boiling point
B. density
C. melting point
D. solubility
40. Given that symbol of element $^{37}_{17}\text{X}$, the number of neutron in the element **X** is
A. 17
B. 37
C. 20
D. 54
41. An element **Y** has 127 neutrons and 82 electrons. Thus, its atomic number is
A. 209
B. 105
C. 127
D. 82
42. Consider two atoms represented as $^{16}_8\text{X}$ and $^{17}_8\text{X}$. The difference between the atoms is in the
A. number of protons
B. number of neutrons
C. number of protons and electrons
D. electronic structure
43. A molecule of *neon* is
A. diatomic
B. monoatomic
C. polyatomic

- D. triatomic
44. Separation of solid mixture containing various sizes can **best** be done through
- magnetic separation
 - coursing
 - sieving
 - chromatography
45. Which of these **requires** crystallization **most**?
- Drug making
 - Cement making
 - Paint making
 - Perfume making
46. In paper and gas **chromatography** respectively, the common **feature** between them is that they have
- solid phase and moving phase
 - stationary phase and moving phase
 - long phase and stationary phase
 - chromatic phase and stationary phase
47. A homogenous mixture can be defined as any mixture
- whose composition is uniform
 - whose composition is not uniform
 - formed by solids and liquids
 - of a solute and a solvent
48. Fractional distillation is used to **separate**
- an insoluble substance from a soluble volatile substance
 - substances which are absorbed differently and which differ in their solubility in a solution
 - liquids with differing boiling points
 - gas, liquid or solid impurities from a mixture
49. A statement of ideas that is still under verification by scientists is **called**
- Hypothesis
 - Theory
 - Law
 - Exploration
50. **All** forms of matter are composed of extremely small particles **called**
- Electron
 - Ion
 - Atom
 - Molecule

PART B

INSTRUCTION: ATTEMPT ANY **FOUR** QUESTIONS

QUESTION 1

- What are **isotopes**?
- An element **Y** exists as an isotopic mixture containing 75% of $^{35}_{17}\text{Y}$ and 25% of $^{37}_{17}\text{Y}$.
 - Deduce the **number of neutrons** present in **each** isotope of **Y**?
 - Calculate the mean relative atomic mass of **Y**
 - Which element does **Y** represent?

- (iv). Give **three** other elements that exhibit similar phenomenon as element Y with their atoms showing this property.
- (c). Give **three** reasons why air is regarded as a mixture.

QUESTION 2

- a(i). What do you **understand** by a chemical industry ?
- (ii). State **three** factors which affect the location of a chemical industry.
- b(i). State **two** positive effects and **one** negative effect of chemical industries on the community.
- (ii). Define raw materials.
- (c). Explain the following **terms**, and give **two** examples on **each**.
- (i). Fine chemicals
- (ii). Heavy chemicals

QUESTION 3

- (a). Write briefly on **each** of the following:
- (i). Atomic number
- (ii). Mass number
- (iii). Relative molecular mass
- b(i). A sample of aluminium has a **mass** of 9.3g. **Calculate**:
- (ii). The number of moles present in aluminium in the sample
[Al = 27, Avogadro's number = 6.02×10^{23}]
- (c). Explain any **two** of the following separation techniques.
- (i). Fractional distillation
- (ii). Crystallization
- (iii). Centrifugation
- (iv). Chromatography

QUESTION 4

(a). Define *each* of following

(i). Empirical formula

(ii). Molecular formula

(b). A sample of *organic compound* contains 0.624g carbon, 0.065g hydrogen, 0.364g nitrogen and 0.208g oxygen.

(i). What is the *empirical formula* of the compound?

(ii). If the relative molecular mass of the compound is **194.0**, what is the molecular formula of the compound?

[C = 12, H = 1, O = 16, N = 14]

(c). State *two* postulates of Dalton's atomic theory and *describe* how they have been modified in recent years.

QUESTION 5

(a). Briefly *explain* what you understand by *each* of the following chemical concepts.

(i). Biotechnology

(ii). Recycling

b(i). Differentiate *between* the melting points and boiling point

(ii). Describe how naphthalene is used to *determine* the melting point, (use of a diagram is essential).

(c). Calculate the percentage composition of *each* constituent element in ammonium tetraoxosulphate(VI), $(\text{NH}_4)_2\text{SO}_4$

[N = 14, H = 1, S = 32, O = 16]