

1 An alkyl group has a general formula of

- A.  $C_nH_{2n-1}$
- B.  $C_nH_{2n+1}$
- C.  $C_nH_{2n-2}^-$
- D.  $C_nH_{2n+1}^+$

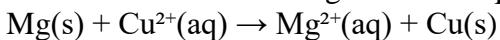
2 The rate of a chemical reaction is affected by all of the following factors **except**

- A. presence of light
- B. nature of reactants
- C. nature of products
- D. surface area of reactants

3. Which of the following compounds would produce effervescence when reacted with sodium hydrogen trioxocarbonate (IV)?

- A.  $CH_3CH_2COOH$
- B.  $CH_3CH_2COOCH_3$
- C.  $CH_3CH_2CH_2OH$
- D.  $CH_3CH_2CHOHCH_3$

4. Consider the following chemical equation:



The species that is reduced is

- A. magnesium atom
- B. copper ions
- C. magnesium ions
- D. copper atom

5. Which of the following substances would react with ethane to form more than one product?

- A. Argon
- B. Hydrogen
- C. Oxygen
- D. Steam

6. Which of the following gases would change colour when bubbled into a phenolphthalein solution?

- A. HCl
- B.  $NH_3$
- C.  $N_2O$
- D.  $H_2S$

7. What is the IUPAC name of  $HCOOCH_2CH_2CH_3$ ?

- A. Butanoic acid
- B. Butanoate
- C. Methyl propanoate
- D. Propyl methanoate

8. On heating  $100\text{ cm}^3$  of a saturated solution to dryness,  $2.5\text{ g}$  of anhydrous salt was obtained. The solubility of the salt would be

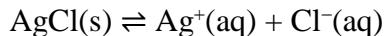
- A.  $40\text{ g dm}^{-3}$
- B.  $25\text{ g dm}^{-3}$
- C.  $4.0\text{ g dm}^{-3}$
- D.  $2.5\text{ g dm}^{-3}$

9. Which of the following compounds is a member of the hydrocarbon series with the general formula  $C_nH_{2n-6}$ ?

- A.  $C_3H_6$
- B.  $C_4H_8$

- C. C<sub>5</sub>H<sub>8</sub>
- D. C<sub>6</sub>H<sub>12</sub>

10. Consider the following equilibrium reaction:



When 0.1 mol dm<sup>-3</sup> HCl is added to the system, the equilibrium position would shift to the

- A. right and the concentration of Ag<sup>+</sup> decreases
- B. right and the concentration of Ag<sup>+</sup> increases
- C. left and the concentration of Ag<sup>+</sup> decreases
- D. left and the concentration of Ag<sup>+</sup> increases

11. Which of the following statements is **not** a characteristic of a redox reaction?

- A. Oxidation number of species change
- B. A precipitate is produced
- C. It involves transfer of electrons
- D. It occurs between oxidizing and reducing agents

12. Which of the following substances is a basic salt?

- A. Mg(OH)NO<sub>3</sub>
- B. Na<sub>2</sub>SO<sub>4</sub>
- C. ZnCl<sub>2</sub>
- D. KAl(SO<sub>4</sub>)<sub>2</sub>·12H<sub>2</sub>O

13. In the electrolysis of AgNO<sub>3</sub>(aq), the current required to deposit 10.8 g of silver in 1 hr 15 mins is

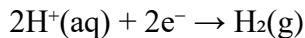
[Ag = 108, 1F = 96500 C]

- A. 1.00 A
- B. 1.50 A
- C. 2.00 A
- D. 2.14 A

14. An aqueous solution of a substance extracted from a plant tasted bitter and has a pH 8. The solution will

- A. turn blue litmus paper red
- B. turn red litmus paper blue
- C. give effervescence with Na<sub>2</sub>CO<sub>3</sub>
- D. have no effect on methyl orange

15. How many moles of electrons would be required to produce 1.12 dm<sup>3</sup> of hydrogen gas at s.t.p from the half-cell reaction?



[molar volume of a gas at s.t.p = 22.4 dm<sup>3</sup>]

- A. 0.01
- B. 0.10
- C. 1.00
- D. 0.20

16. When a sample of a gas is heated at constant pressure, the average kinetic energy of its molecules usually

- A. decreases and the volume decreases
- B. decreases and the volume increases
- C. increases and the volume increases
- D. increases and the volume decreases

17. Graphite can be used in making

- A. electrodes.
- B. electrical wires.
- C. metal plates.
- D. roofing sheets.

**18.** A salt whose aqueous solution does not form white precipitate with ammonium trioxocarbonate (IV) contains

- A. lead.
- B. calcium.
- C. iron.
- D. potassium.

**19.** When an electrolyte dissolves in water, it would break down into charged particles by

- A. dissociation process.
- B. electrolytic process.
- C. neutralization process.
- D. contact process.

**20.** The names of Newlands, Mendeleev and Meyer are associated with the development of

- A. atomic structure.
- B. metallurgy.
- C. periodic table.
- D. electrochemical series.

**21.** If an electrochemical cell has a cell emf of  $-1.26\text{ V}$ , the cell reaction would be

- A. spontaneous.
- B. non-spontaneous.
- C. at equilibrium.
- D. slow.

**22.** The random movement of a speck of a solid in a liquid or gas is known as

- A. Brownian motion.
- B. suspension.
- C. diffusion.
- D. osmosis.

**23.** The behaviour of real gases deviates from that of ideal gases mostly at

- A. high pressures and low temperatures.
- B. high pressures and high temperatures.
- C. low pressures and high temperatures.
- D. low pressures and low temperatures.

**24.** Which of the following gas samples contains  $3.0 \times 10^{23}$  molecules?

- A. 71.0 g of  $\text{Cl}_2$
- B. 2.0 g of  $\text{H}_2$
- C. 14.0 g of  $\text{N}_2$
- D. 38.0 g of  $\text{F}_2$

**25.** Which of the following statements about  $\text{Ca}(\text{OH})_2$  is correct? It is

- A. a strong base.
- B. an alkali.
- C. soluble in water.
- D. slaked to form quicklime.

**26.** The empirical formula of the compound with molecular formula  $\text{C}_2\text{H}_4\text{O}_2$  is

- A.  $\text{CH}_2\text{O}$ .
- B.  $\text{CHO}_2$ .
- C.  $\text{CHO}$ .
- D.  $\text{C}_2\text{H}_4\text{O}_2$ .

**27.** When elements  ${}^{12}\text{Z}$  and  ${}^{17}\text{Y}$  combine, they form

- A. a covalent compound  $\text{ZY}_2$ .

- B. an ionic compound  $\text{YZ}_2$ .
- C. an ionic compound  $\text{ZY}_2$ .
- D. a covalent compound  $\text{YZ}_2$ .

**28.** Where on the periodic table would an element with electron configuration  $1s^2 2s^2 2p^6 3s^2 3p^3$  be found?

- A. Group III, period 3
- B. Group III, period 5
- C. Group V, period 5
- D. Group V, period 3

**29.** Which of the following salts is insoluble in water?

- A.  $\text{CaCO}_3$
- B.  $\text{CaCl}_2$
- C.  $\text{NaCl}$
- D.  $\text{Na}_2\text{SO}_4$

**30.** How many moles of  $\text{K}^+$  ions are there in  $0.12 \text{ dm}^3$  of  $0.015 \text{ mol dm}^{-3} \text{ K}_2\text{SO}_4(\text{aq})$ ?

- A.  $1.8 \times 10^{-3} \text{ mol}$
- B.  $3.6 \times 10^{-3} \text{ mol}$
- C.  $5.4 \times 10^{-3} \text{ mol}$
- D.  $7.2 \times 10^{-3} \text{ mol}$

**31.** Which of the following atoms would have the strongest attraction for electrons?

- A. Aluminium
- B. Chlorine
- C. Silicon
- D. Sodium

**32.** Which of the following compounds contains both covalent and ionic bonds?

- A.  $\text{NaCl(g)}$
- B.  $\text{HCl(g)}$
- C.  $\text{NaNO}_3(\text{s})$
- D.  $\text{N}_2\text{O}_5(\text{s})$

**33.** The atom that would have three unpaired p-electrons is

- A.  $^{14}_7\text{N}$
- B.  $^{19}_9\text{F}$
- C.  $^{16}_8\text{O}$
- D.  $^{12}_6\text{C}$

**34.** The maximum number of electrons that could be accommodated in a shell having the principal quantum number 4 is

- A. 4
- B. 8
- C. 16
- D. 32

**35.** Sodium chloride would be readily soluble in a

- A. non-polar solvent.
- B. polar solvent.
- C. saturated solvent.
- D. neutral solvent.

**36.** Consider the following equation:



The oxidation number of chromium changes from

- A. +6 to +3
- B. +6 to +2
- C. +7 to +2
- D. +2 to +3

37. Which of the following elements has the least first ionization energy?

- A. Silicon
- B. Nitrogen
- C. Fluorine
- D. Phosphorus

38. Which of the following statements is not correct about 3d-orbitals?

- A. It can be partially filled.
- B. It belongs to the quantum number three.
- C. It is in the lower energy level than 4s-orbital.
- D. Pairing of electrons in the orbitals may occur.

39. Atomic size of elements increases down a group of the periodic table due to

- A. increase in nuclear charge
- B. increase in number of shells
- C. decrease in nuclear charge
- D. decrease in number of shells

40. Electronegativity is a measure of

- A. ability of an atom to draw electron cloud towards itself in a bond
- B. energy required in removing an electron from an atom
- C. energy released when an electron is added to an atom
- D. magnitude of the charge on an electron

41. The energy sublevel that is filled with electrons in elements with atomic numbers 21 and 29 is

- A. 3s
- B. 3d
- C. 4p
- D. 4d

42. A major concern of chemistry is the

- A. composition of substances and the changes they undergo
- B. advertisement of chemicals and their levels of toxicity
- C. lucrative index of chemical allied industries and their citing
- D. destructive use of nuclear energy

43. Which of the following properties is a characteristic of a pure substance?

- A. High boiling point
- B. Colourless solution
- C. Sharp melting point
- D. High density

44. Graham's law states that at constant temperature and pressure, the

- A. rate of diffusion of a gas is directly proportional to the square of its vapour density
- B. rate of diffusion of a gas is directly proportional to the square root of its vapour density
- C. rate of diffusion of a gas is inversely proportional to the square root of its vapour density
- D. mass of a gas is directly proportional to the square root of its vapour density

45. Fractional crystallization is used to separate different substances

- A. that have the same solubility in the same solvent
- B. that have different solubilities in the same solvent

- C. with different solubilities in different solvents
- D. that have same solubility in different solvents

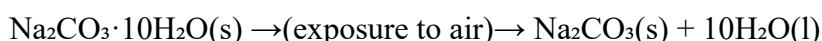
**46.** Which of the following statements about polythene is correct? It

- A. decays in water.
- B. is not biodegradable.
- C. is a polymer of saturated monomers.
- D. is a product of condensation reaction.

**47.** The substance that is a natural polymer is

- A. starch.
- B. nylon.
- C. polystyrene.
- D. chlorophyll.

**48.** Consider the following reaction equation:



What name is given to this type of reaction?

- A. Decomposition
- B. Deliquescence
- C. Efflorescence
- D. Hygroscopy

**49.** Alkanes are hazardous because they are

- A. corrosive.
- B. flammable.
- C. toxic when inhaled.
- D. toxic to the skin.

**50.** Which of the following factors should be considered when siting a factory in a particular country?

- I. Government policy
- II. The number of ethnic groups
- III. The official language of the country
- IV. Availability of raw materials

- A. I and II only
- B. II and III only
- C. I and IV only
- D. III and IV only

Answer

- 1: B
- 2: C
- 3: A
- 4: B
- 5: C
- 6: B
- 7: D
- 8: B
- 9: D
- 10: C
- 11: B
- 12: A
- 13: D

14: B  
15: B  
16: C  
17: A  
18: D  
19: A  
20: C  
21: B  
22: A  
23: A  
24: C  
25: B  
26: A  
27: C  
28: D  
29: A  
30: B  
31: B  
32: C  
33: A  
34: D  
35: B  
36: A  
37: A  
38: C  
39: B  
40: A  
41: B  
42: A  
43: C  
44: C  
45: B  
46: B  
47: A  
48: C  
49: B  
50: C