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:
$Mg(s) + Cu^{2+}(aq) \rightarrow Mg^{2+}(aq) + Cu(s)$
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 cm^3 of a saturated solution to dryness, 2.5 g of anhydrous salt was obtained. The solubility of the salt would be
A. 40 g dm^{-3}
B. 25 g dm^{-3}
C. 4.0 g dm^{-3}
D. 2.5 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_5H_8
D. C_6H_{12}

10. Consider the following equilibrium reaction:
$AgCl(s) \rightleftharpoons Ag^+(aq) + Cl^-(aq)$
When 0.1 mol dm^{-3} HCl is added to the system, the equilibrium position would shift to the
A. right and the concentration of Ag^+ decreases
B. right and the concentration of Ag^+ increases
C. left and the concentration of Ag^+ decreases
D. left and the concentration of Ag^+ 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. $Mg(OH)NO_3$
B. Na_2SO_4
C. $ZnCl_2$
D. $KAl(SO_4)_2 \cdot 12H_2O$

13. In the electrolysis of $AgNO_3(aq)$, 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_2CO_3
D. have no effect on methyl orange

15. How many moles of electrons would be required to produce 1.12 dm^3 of hydrogen gas at s.t.p from the half-cell reaction?
$2H^+(aq) + 2e^- \rightarrow H_2(g)$
[molar volume of a gas at s.t.p = 22.4 dm^3]
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 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 3.0×10^{23} molecules?
A. 71.0 g of Cl_2
B. 2.0 g of H_2
C. 14.0 g of N_2
D. 38.0 g of F_2

25. Which of the following statements about $Ca(OH)_2$ 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 $C_2H_4O_2$ is
A. CH_2O.
B. CHO_2.
C. CHO.
D. $C_2H_4O_2$.

27. When elements ^{12}Z and ^{17}Y combine, they form
A. a covalent compound ZY_2.

B. an ionic compound YZ_2.
C. an ionic compound ZY_2.
D. a covalent compound 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. $CaCO_3$
B. $CaCl_2$
C. NaCl
D. Na_2SO_4

30. How many moles of K^+ ions are there in 0.12 dm^3 of 0.015 mol dm^{-3} $K_2SO_4(aq)$?
A. 1.8×10^{-3} mol
B. 3.6×10^{-3} mol
C. 5.4×10^{-3} mol
D. 7.2×10^{-3} 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. NaCl(g)
B. HCl(g)
C. $NaNO_3(s)$
D. $N_2O_5(s)$

33. The atom that would have three unpaired p-electrons is
A. $^{14}_{7}N$
B. $^{19}_{9}F$
C. $^{16}_{8}O$
D. $^{12}_{6}C$

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:

$$K_2Cr_2O_7 + 14HCl \rightarrow 2KCl + 2CrCl_3 + 7H_2O + 3Cl_2$$

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:

$Na_2CO_3 \cdot 10H_2O(s) \rightarrow$(exposure to air)$\rightarrow Na_2CO_3(s) + 10H_2O(l)$

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