Myfuture CBC Revision chemisty - Grade 10

Question Paper

1. When is a bond most likely to be ionic based on electronegativity difference (EN)?

A. When EN difference is exactly zero

B. When EN difference is between 0.1 and 0.4

C. When EN values are identical

D. When EN difference is greater than about 1.7

2. What is the main salt formed in the reaction between hydrochloric acid and sodium hydroxide during a titration in the lab?

A. Sodium sulfate (Na2SO4)

B. Potassium chloride (KCl)

C. Sodium chloride (NaCl)

D. Calcium carbonate (CaCO3)

3. At 25°C what is the relationship between pH and pOH?

A. pH - pOH = 7

B. pH + pOH = 14

C. pH × pOH = 14

D. pH = pOH always

4. At the equivalence point of a titration between a strong acid and a strong base, what is the approximate pH?

A. 14

B. Around 11

C. 7

D. 1

5. Which particles are found in the nucleus of an atom?

A. Only electrons

B. Protons and neutrons

C. Electrons and protons

D. Electrons and neutrons

6. Which of these elements is most electronegative?

A. Chlorine

B. Fluorine

C. Potassium

D. Sodium

7. Why are noble gases generally unreactive (inert)?

A. They easily lose electrons

B. They have very low atomic numbers

C. They have very large atomic radii

D. They have a full outer electron shell

8. What is the oxidation state of magnesium in MgCl2?

A. +1

B. -2

C. +2

D. 0

9. What colour does red litmus paper show when placed in a basic solution?

A. It turns yellow

B. It turns blue

C. It turns red

D. It turns colourless

10. The atomic number of an element gives the number of:

A. Electrons in the nucleus

B. Protons in the nucleus

C. Isotopes the element has

D. Neutrons in the nucleus

11. Which statement correctly distinguishes acid strength from acid concentration?

A. Strength and concentration mean the same thing

B. Strength is how much acid is present; concentration is how well it ionises

C. Strength is the degree of ionisation; concentration is the amount of acid dissolved

D. Strength is only about taste, while concentration is chemical

12. What is the bond order of the oxygen molecule O2 (written as O=O)?

A. 2

B. 3

C. 1

D. 4

13. Which salt would give a solution with pH above 7 when dissolved in water?

A. Ammonium chloride

B. Sodium chloride

C. Sodium carbonate

D. Potassium chloride

14. What salt is formed when magnesium oxide reacts with hydrochloric acid?

A. Magnesium carbonate

B. Magnesium chloride

C. Magnesium sulfate

D. Magnesium hydroxide

15. Why is an aqueous solution of sodium acetate (CH3COONa) slightly basic?

A. Because sodium acetate releases H+ ions making the solution acidic

B. Because all salts are always strongly basic

C. Because the acetate ion is the conjugate base of a weak acid and hydrolyses to produce

D. Because acetate reacts with water to produce chlorine gas

16. Which factors tend to increase the lattice energy of an ionic salt, giving it higher melting point?

A. Larger ionic radii and lower ionic charges

B. Higher amounts of water in the crystal

C. Presence of covalent bonds only

D. Smaller ionic radii and higher ionic charges

17. Which salt is commonly used as a nitrogen fertiliser in agriculture?

A. Calcium carbonate (CaCO3)

B. Sodium chloride (NaCl)

C. Copper sulfate (CuSO4)

D. Ammonium nitrate (NH4NO3)

18. Which chemical symbol represents the element potassium?

A. P

B. Po

C. Pt

D. K

19. Which of these salts is largely insoluble in water and appears as a white solid when formed?

A. Sodium chloride (NaCl)

B. Potassium nitrate (KNO3)

C. Silver chloride (AgCl)

D. Ammonium nitrate (NH4NO3)

20. Why are noble gases generally unreactive (inert)?

A. They are always found as solids at room temperature

B. They have full outer electron shells and are stable

C. They have no protons in the nucleus

D. They have extremely large atomic radii

21. What is chemistry?

A. The study of numbers and their relationships

B. The study of matter and the changes it undergoes

C. The study of planets and stars

D. The study of living organisms only

22. Which statement best distinguishes a weak acid from a strong acid at the same concentration?

A. A weak acid partially ionises in water while a strong acid fully ionises

B. A weak acid is always a solid and strong acid is liquid

C. A weak acid contains fewer hydrogen atoms per molecule

D. A weak acid always has a higher pH than a strong acid of the same concentration

23. When aqueous barium chloride ($BaCl_2$) is mixed with aqueous sodium sulfate (Na_2SO_4), which solid precipitate forms?

A. Sodium chloride (NaCl)

B. Barium chloride remains only in solution

C. Barium sulfate ($BaSO_4$)

D. Sodium sulfate precipitates as a solid

24. On the periodic table, where are metals generally located compared to non-metals?

A. Metals are only in the top row; non-metals only in the bottom row

B. Metals are mostly on the left and centre; non-metals are on the right

C. Metals are on the right; non-metals are on the left

D. Metals and non-metals are randomly mixed with no pattern

25. During titration, the equivalence point is reached when which of the following is true?

A. Volumes of acid and base are equal

B. Moles of acid neutralised equal moles of base added

C. The concentration of acid equals the concentration of base

D. Both solutions have the same colour

26. Which of the following is a compound?

A. Iron filings

B. Helium gas

C. Salt (sodium chloride)

D. Copper

27. Which pair of atoms is most likely to form a covalent bond?

A. Cl and Cl

B. Mg and O

C. Ca and Ca

D. Na and Cl

28. Which unit is used to measure the amount of substance in chemistry?

A. Watt

B. Liter

C. Kilogram

D. Mole

29. What happens when an alkali metal (group 1) reacts with water?

A. It produces oxygen gas

B. There is no reaction

C. It forms an alkaline solution and releases hydrogen gas

D. It forms an acidic solution

30. Which pair of elements are in the same group and therefore have similar reactivity: magnesium and calcium, carbon and oxygen, sodium and chlorine, helium and lithium?

A. Magnesium and calcium

B. Helium and lithium

C. Carbon and oxygen

D. Sodium and chlorine

31. When aqueous silver nitrate and aqueous sodium chloride are mixed, what happens?

A. A white insoluble salt (silver chloride) precipitates

B. A blue solution forms

C. No reaction occurs and everything stays dissolved

D. The mixture becomes a gas

32. What is the pH of a 0.001 M solution of HCl?

A. pH = 3

B. pH = 7

C. pH = 1

D. pH = 11

33. When hydrochloric acid (HCl) reacts completely with sodium hydroxide (NaOH), which salt is formed?

A. Sodium chloride (NaCl)

B. Potassium chloride (KCl)

C. Calcium chloride (CaCl2)

D. Sodium sulfate (Na2SO4)

34. Which statement best describes isotopes of the same element?

A. They have different atomic numbers

B. They have the same mass number but different chemical properties

C. They have different numbers of protons and electrons

D. They have the same number of protons but different numbers of neutrons

35. What is a salt in chemistry?

A. Pure water containing dissolved gas

B. An ionic compound formed from the neutralisation of an acid and a base

C. A mixture of an acid and a base that do not react

D. A covalent molecule made only of non-metals

36. What is the common name of NaCl used daily in Kenyan households?

A. Epsom salt

B. Baking soda

C. Vinegar

D. Table salt

37. Which of these is a correct example of a neutralisation reaction?

A. $CO_2 + H_2O \rightarrow H_2CO_3$

B. $NH_3 + H^+ \rightarrow NH_4^+$

C. $HCl + NaOH \rightarrow NaCl + H_2O$

D. $H_2O \rightarrow H^+ + OH^-$

38. Which salt is produced when potassium hydroxide (KOH) neutralises sulfuric acid (H_2SO_4)?

A. Sodium sulfate (Na_2SO_4)

B. Potassium sulfate (K_2SO_4)

C. Potassium chloride (KCl)

D. Potassium nitrate (KNO_3)

39. What salt is formed when nitric acid reacts with potassium hydroxide?

A. Potassium carbonate

B. Potassium chloride

C. Potassium nitrate

D. Potassium sulphate

40. Which subatomic particle carries no electrical charge?

A. Electron

B. Neutron

C. Proton

D. Positron

41. Which hydrogen isotope has one proton and two neutrons?

A. Deuterium

B. Protium

C. Hydron

D. Tritium

42. What are the products of a neutralisation reaction between an acid and a base?

A. A new acid only

B. Hydrogen gas and oxygen gas

C. A salt and water

D. Only heat

43. Which type of covalent bond is strongest among single, double and triple bonds?

A. Triple bond

B. Single bond

C. All are equally strong

D. Double bond

44. What is the pH of a 0.01 M solution of sodium hydroxide (NaOH)?

A. 2

B. 11

C. 12

D. 7

45. During titration of a weak acid with a strong base, the pH at the equivalence point is usually:

A. Greater than 7 (basic)

B. Exactly 14

C. Equal to 7 (neutral)

D. Less than 7 (acidic)

46. Phenolphthalein is commonly used as an indicator. What colour does it show in a basic solution?

A. Blue

B. Red

C. Yellow

D. Pink

47. When hydrochloric acid reacts with sodium hydroxide, which salt is formed?

A. Sodium chloride

B. Sodium hydroxide

C. Sodium oxide

D. Hydrochloric sodium

48. How many valence electrons does a neutral sulfur atom have?

A. 2

B. 6

C. 4

D. 8

49. What is the correct formula for calcium carbonate (the main component of limestone)?

A. $CaCO_2$

B. Ca_2CO_3

C. $CaCO_3$

D. CaC_2O_4

50. Which statement correctly links an element's period number to its electronic structure?

A. The period number equals the number of neutrons

B. The period number equals the atomic mass

C. The period number equals the number of valence electrons

D. The period number equals the highest occupied energy level (shell)