Myfuture CBC Revision

chemisty - Grade 10

Question Paper

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

A. Watt

B. Kilogram

C. Mole

D. Liter

2. What does the atomic number of an element tell you?

A. The total mass of the atom in grams

B. The number of neutrons in the nucleus

C. The number of electron shells

D. The number of protons in the nucleus

3. Which of the following is an element?

A. Oxygen

B. Sodium chloride

C. Water

D. Air

4. An ionic bond usually forms between:

A. Two noble gases

B. Two non-metals

C. A metal and a non-metal

D. Two metals

5. What is the general trend in atomic radius as you move from left to right across a period?

A. Atomic radius first increases then drops to zero

B. Atomic radius stays the same

C. Atomic radius increases

D. Atomic radius decreases

6. What does the law of conservation of mass state?

A. Mass cannot be created or destroyed in a chemical reaction
B. Mass always equals volume

C. Mass is created during chemical reactions

D. Mass is lost when substances react

7. Which property generally increases across a period and is associated with an atom's ability to attract electrons in a bond?

A. Atomic radius

B. Number of electron shells

C. Metallic character

D. Electronegativity

8. What is the main reason for the irregularity where boron has a lower first ionisation energy than beryllium?

A. Boron is a noble gas

B. Boron has more electron shells than beryllium

C. Boron has fewer protons than beryllium

D. Boron’s outer electron is in a 2p orbital which is slightly easier to remove than beryllium’s 2s

9. What does 'periodicity' in the periodic table mean?

A. The repeating pattern of chemical and physical properties of elements across periods
B. That elements are randomly placed with no order

C. The arrangement of elements according to their colour

D. The order of elements by their atomic weights only

10. How does atomic radius change when moving left to right across a period?

A. It generally decreases because nuclear charge increases pulling electrons closer
B. It generally increases because more electron shells are added
C. It stays exactly the same for all elements in the period

D. It decreases because neutrons are lost

11. Which element is most metallic: lithium, beryllium, boron or carbon?

A. Lithium

B. Beryllium

C. Carbon

D. Boron

12. What is the common charge of ions formed by Group 1 (alkali) metals?

A. 0 (they do not form ions)

B. +1

C. +2

D. -1

13. What is the charge of the ion formed when magnesium (Mg) loses two electrons?

A. 0

B. +2

C. -2

D. +1

14. Which statement explains the shielding effect?

A. Outer electrons increase the nuclear charge felt by inner electrons

B. Shielding causes nuclear reactions

C. Protons shield electrons from other protons

D. Inner electrons reduce the effective pull of the nucleus on outer electrons

15. Why does atomic radius generally increase down a group despite increased nuclear charge?

A. Because protons are lost down a group

B. Because new electron shells are added which outweigh increased nuclear pull

C. Because elements down a group have fewer electrons

D. Because ionisation energy increases down the group

16. Where are the lanthanides and actinides placed in the periodic table?

A. In the p-block along the right side

B. In group 1 with the alkali metals

C. In the separate f-block rows shown below the main table

D. They do not belong to any block

17. Which of the following is a cation?

A. Cl

B. F

C. O2

D. Na+

18. What does the period number (row) tell you about an element?

A. The number of valence electrons

B. The number of occupied electron shells

C. The common ionic charge

D. The colour of the element

19. Who proposed that atoms are indivisible solid spheres as the earliest atomic model?

A. J.J. Thomson

B. Niels Bohr

C. John Dalton

D. Ernest Rutherford

20. How many electrons does a Mg2+ ion have? (Magnesium atomic number 12)

A. 10

B. 12

C. 2

D. 14

21. Chlorine has atomic number 17 and mass number 35. How many neutrons does a chlorine-35 atom have?

A. 35

B. 52

C. 17

D. 18

22. How does first ionisation energy change down a group?

A. It increases because atoms gain more protons

B. It remains exactly the same

C. It oscillates wildly with no trend

D. It decreases because outer electrons are farther from the nucleus and more shielded

23. Why do elements in the same period show a change from metallic to non-metallic character?

A. Because elements gain more shells across the period

B. Because valence electrons increase across the period, making atoms hold electrons more

C. Because atomic mass falls to zero

D. Because the number of neutrons decreases across a period

24. What does the atomic number of an element represent?

A. The total number of neutrons and protons

B. The number of protons in the nucleus of an atom

C. The mass of one mole of the element

D. The number of energy shells

25. When sodium metal reacts with water, which products are formed?

A. Sodium carbonate and carbon dioxide

B. Sodium hydroxide and hydrogen gas

C. Sodium chloride and water

D. Sodium oxide and oxygen gas

26. Relative atomic mass shown on the periodic table is best described as:

A. The mass of the heaviest isotope only

B. A weighted average mass of an element’s isotopes taking their abundances into account

C. The number of protons in the nucleus

D. The exact mass of one atom measured in grams

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

A. The period number equals the atomic mass

B. The period number equals the number of valence electrons

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

D. The period number equals the number of neutrons

28. Which element has the highest electronegativity in the periodic table?

A. Fluorine

B. Sodium

C. Helium

D. Potassium

29. Which of the following is a molecule?

A. Cl

B. Na+

C. H2O

D. Fe (iron atom)

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. Sodium and chlorine

B. Magnesium and calcium

C. Carbon and oxygen

D. Helium and lithium

31. What is the general trend in atomic radius as you move down a group?

A. Atomic radius becomes zero

B. Atomic radius increases

C. Atomic radius decreases

D. Atomic radius stays constant

32. Which laboratory safety practice should you follow when heating chemicals?

A. Keep flammable materials nearby to save time

B. Wear safety goggles and heat-resistant gloves

C. Smell the vapour directly to identify it

D. Never wear goggles because they fog

33. How many valence electrons does an oxygen atom have? (O, atomic number 8)

A. 6

B. 2

C. 4

D. 8

34. The mass number of an atom is the sum of:

A. Protons and electrons and neutrons

B. Electrons and protons

C. Neutrons and electrons

D. Protons and neutrons

35. A neutral chlorine atom has 17 electrons. What is the number of electrons in a chloride ion (Cl^-)?

A. 17

B. 16

C. 19

D. 18

36. Which element is likely to form a negative ion (anion) with a -1 charge?

A. Calcium

B. Aluminium

C. Iron

D. Chlorine

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

A. Protons and neutrons

B. Only electrons

C. Electrons and protons

D. Electrons and neutrons

38. What is chemistry?

A. The study of living organisms only

B. The study of numbers and their relationships

C. The study of matter and the changes it undergoes

D. The study of planets and stars

39. A neutral aqueous solution at room temperature has a pH closest to:

A. 10

B. 7

C. 1

D. 14

40. What type of bond is formed between sodium (a metal) and chlorine (a non-metal)?

A. Covalent bond

B. Metallic bond

C. Ionic bond

D. Hydrogen bond

41. Which element has a full valence shell and is therefore most chemically inert among these: oxygen, fluorine, neon, sodium?

A. Sodium

B. Neon

C. Oxygen

D. Fluorine

42. Which subatomic particle has a very small mass and a negative charge?

A. Proton

B. Electron

C. Alpha particle

D. Neutron

43. How many valence electrons do elements in group 15 (the nitrogen group) have?

A. 2

B. 5

C. 3

D. 7

44. Which subatomic particle has a positive charge and is located in the nucleus?

A. Proton

B. Electron

C. Neutron

D. Photon

45. A neutral sodium atom has atomic number 11. How many electrons does it have?

A. 11

B. 10

C. 22

D. 1

46. Which scientist’s model concluded that most of the atom’s mass is in a small dense nucleus?

A. Rutherford

B. Dalton

C. Mendeleev

D. Thomson

47. Which element is an alkali metal found in group 1 of the Periodic Table?

A. Sodium

B. Carbon

C. Chlorine

D. Oxygen

48. Which type of chemical bond is formed when two atoms share electrons?

A. Metallic bond

B. Hydrogen bond

C. Covalent bond

D. Ionic bond

49. What is the chemical formula for sodium chloride (table salt)?

A. KCl

B. NaCl

C. Na2O

D. Cl2

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

A. They have the same number of protons but different numbers of neutrons
B. They have the same mass number but different chemical properties
C. They have different numbers of protons and electrons

D. They have different atomic numbers