# Myfuture CBC Revision

# chemisty - Grade 10

Question Paper

1. Why do ionic crystals form a lattice structure?

A. Because electrons become delocalised over many atoms

B. Because atoms share electrons to form molecules

C. Because atoms form isolated neutral molecules

D. Because alternating cations and anions arrange to maximize attractive forces and

2. Which statement best describes metallic bonding?

A. Positive metal ions surrounded by a sea of delocalised electrons

B. A bond that forms only between nonmetals

C. Sharing of electrons only between two atoms

D. Complete transfer of electrons forming charged ions

3. What is the shape of the carbon dioxide ($CO_2$) molecule?

A. Tetrahedral

B. Trigonal planar

C. Linear

D. Bent

4. Which species contains a coordinate (dative) bond?

A. Sodium chloride (NaCl)

B. Ammonium ion ($NH_4^+$)

C. Oxygen molecule ($O_2$)

D. Chloride ion ($Cl^-$)

5. How many electrons are shared in a double covalent bond?

A. 4

B. 1

C. 8

D. 6

6. What is the oxidation state of magnesium in $MgCl_2$?

A. -2

B. +1

C. +2

D. 0

7. What is the usual oxidation state of noble gases in their stable form?

A. +2

B. 0

C. -1

D. +1

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 fewer protons than beryllium

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

D. Boron has more electron shells than beryllium

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

A. The number of protons in the nucleus

B. The total mass of the atom in grams

C. The number of neutrons in the nucleus

D. The number of electron shells

10. Which method helps predict how reactive an element will be using the periodic table?

A. Look only at its melting point

B. Look at its position in a group (elements in the same group have similar reactivity)

C. Look only at its density

D. Look only at its atomic mass

11. How does ionisation energy generally change across a period from left to right?

A. Ionisation energy increases

B. Ionisation energy alternates up and down without pattern

C. Ionisation energy decreases

D. Ionisation energy stays the same

12. An ionic bond usually forms between:

A. Two noble gases

B. A metal and a non-metal

C. Two metals

D. Two non-metals

13. What type of ion is formed when an atom loses one or more electrons?

A. A positive ion (cation)

B. A negative ion (anion)

C. A neutral isotope

D. A radioactive atom

14. Elements in the same group have similar chemical properties because they have the same:

A. Number of valence electrons

B. Melting points

C. Atomic masses

D. Number of neutron shells

15. What is the electronic configuration of sodium (Na, atomic number 11) in terms of electrons per shell?

A. 2, 9

B. 2, 8, 2

C. 2, 11

D. 2, 8, 1

16. Which description best explains an ionic bond?

A. Attraction between a nucleus and electrons in the same atom

B. Delocalised electrons moving among positive metal ions

C. Sharing of electron pairs equally between two identical atoms

D. Electrostatic attraction between oppositely charged ions formed by electron transfer

17. In the periodic table, what does a group refer to?

A. A horizontal row of elements

B. A single element

C. A vertical column of elements

D. A region of only metals

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

A. 2

B. 10

C. 12

D. 14

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

A. 1

B. 7

C. 14

D. 10

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

A. 17

B. 52

C. 35

D. 18

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

A. In group 1 with the alkali metals

B. In the p-block along the right side

C. They do not belong to any block

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

22. Which of the following is a physical change?

A. Melting ice

B. Cooking an egg

C. Rusting of iron

D. Burning wood

23. What causes bright lines in an element's emission spectrum?

A. Nuclei splitting into smaller parts

B. Protons changing into electrons

C. Electrons dropping to lower energy levels and releasing photons

D. Atoms gaining neutrons

24. Which of these will conduct electricity in the solid state?

A. Solid oxygen

B. Copper metal

C. Solid sodium chloride

D. Solid sugar (sucrose)

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

A. Because ionisation energy increases down the group

B. Because protons are lost down a group

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

D. Because elements down a group have fewer electrons

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

A. It oscillates wildly with no trend

B. It remains exactly the same

C. It increases because atoms gain more protons

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

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

A. Oxygen

B. Neon

C. Fluorine

D. Sodium

28. The molar mass (approximate formula mass) of water ($H_2O$) in g/mol is:

A. 2 g/mol

B. 18 g/mol

C. 34 g/mol

D. 10 g/mol

29. What happens to metallic character as you move across a period from left to right?

A. Metallic character increases

B. Metallic character stays the same

C. All elements become metals

D. Metallic character decreases

30. Which of the following is a compound?

A. Salt (sodium chloride)

B. Copper

C. Iron filings

D. Helium gas

31. Which molecule is nonpolar despite containing polar bonds?

A. $NH_3$

B. $H_2O$

C. $CO_2$

D. HF

32. Approximately how many atomic mass units (amu) is the mass of a proton?

A. 0.0005 amu

B. 12 amu

C. 1000 amu

D. 1 amu

33. According to the Bohr model, where are electrons found?

A. Only in chemical bonds

B. In fixed energy levels or shells around the nucleus

C. Randomly fixed inside the proton

D. Inside the nucleus

34. Which statement explains why alkali metals are very reactive?

A. They have low first ionisation energies, so they lose their one valence electron easily

B. They form covalent bonds with noble gases

C. They have full valence shells and refuse to react

D. They have very high electronegativities

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

A. Atomic radius increases

B. Atomic radius stays constant

C. Atomic radius decreases

D. Atomic radius becomes zero

36. Which property is typical of metals?

A. Always gaseous at room temperature

B. Brittle and non-lustrous

C. Poor conductor of heat

D. Good conductor of electricity

37. 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

38. 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

39. Potassium (K) has atomic number 19 and mass number 39. How many neutrons does it have?

A. 19

B. 20

C. 58

D. 39

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

A. The mass of the atom in grams

B. The number of protons in the atom

C. The total number of protons and neutrons

D. The number of electrons in all shells

41. 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

42. What is the correct formula for the ionic compound formed from Mg2+ and Cl-?

A. MgCl2

B. MgCl3

C. Mg2Cl

D. MgCl

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

A. The exact mass of one atom measured in grams

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

C. The mass of the heaviest isotope only

D. The number of protons in the nucleus

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

A. 17

B. 18

C. 16

D. 19

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

A. 11

B. 10

C. 1

D. 22

46. What is the definition of first ionisation energy?

A. The energy needed to change a solid to a liquid

B. The energy released when an electron is added to an atom

C. The energy required to remove one electron from a neutral atom in the gas phase

D. The energy needed to break a chemical bond

47. Which of the following is a cation?

A. Na+

B. O2

C. Cl

D. F

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

A. Electronegativity

B. Number of electron shells

C. Metallic character

D. Atomic radius

49. Which change will generally increase the rate of a chemical reaction?

A. Diluting the reactants heavily

B. Adding a catalyst

C. Decreasing the temperature

D. Reducing surface area of solid reactants

50. Which is a typical property of transition metals?

A. They are located in group 1

B. They often show variable oxidation states and form coloured compounds

C. They are all gases at room temperature

D. They have only one oxidation state and are always colourless