

AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS IX

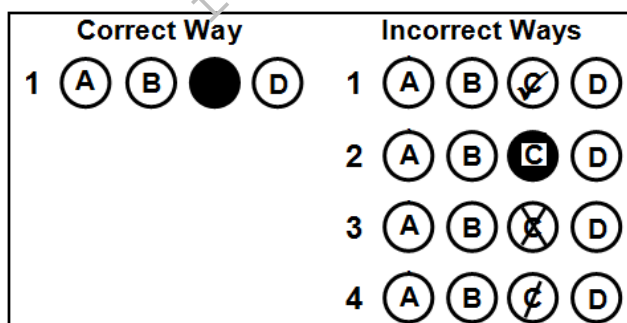
ANNUAL EXAMINATIONS (THEORY) 2025

Chemistry Paper I

Time: 1 hour 10 minutes Marks: 40

INSTRUCTIONS

1. Read each question carefully.
2. Answer the questions on the separate answer sheet provided. DO NOT write your answers on the question paper.
3. There are 100 answer numbers on the answer sheet. Use answer numbers 1 to 40 only.
4. In each question there are four choices A, B, C, D. Choose ONE. On the answer grid black out the circle for your choice with a pencil as shown below.



Candidate's Signature

5. If you want to change your answer, ERASE the first answer completely with a rubber, before blacking out a new circle.
6. DO NOT write anything in the answer grid. The computer only records what is in the circles.
7. You may use a simple calculator if you wish.

1. Ozone (O_3) is a highly reactive gas which is formed in the stratosphere with the help of ultraviolet radiations.

If 10.5 moles of ozone gas is formed in the stratosphere, then its mass in grams will be

(Note: $^{16}_8O$)

- A. 84
 B. 168
 C. 252
 D. 504
2. Which of the following pairs of substances represents pure compounds?

	Substance I	Substance II
A	Air	Water
B	Ammonia	Water
C	Air	Sea water
D	Ammonia	Sea water

3. The ions/ radicals in each of the given compounds have a valency of 2 EXCEPT

- A. NH_3
 B. BeO
 C. $CaSO_4$
 D. $MgCO_3$

4. A compound contains 40% carbon, 6.7% hydrogen and 53.3% oxygen by mass.

Based on the given information, the empirical formula of this compound is

(Note: 1_1H , $^{12}_6C$ and $^{16}_8O$)

- A. CH_2O
 B. CH_2O_2
 C. C_2H_4O
 D. $C_3H_6O_3$
5. The equation that exemplifies single displacement reaction is
- A. $CaO_{(s)} + H_2O_{(l)} \rightarrow Ca(OH)_{2(aq)}$
 B. $CuSO_{4(aq)} + Zn_{(s)} \rightarrow ZnSO_{4(aq)} + Cu_{(s)}$
 C. $H_2SO_{4(aq)} + 2NH_{3(g)} \rightarrow (NH_4)_2SO_{4(aq)}$
 D. $2AgNO_{3(aq)} + BaCl_{2(aq)} \rightarrow 2AgCl_{(s)} + Ba(NO_3)_{2(aq)}$

6. Which of the following statements defines a solution?
- A. A pure compound having one or more solutes dissolved in a solvent
 - B. A homogeneous mixture having one or more solutes dissolved in a solvent
 - C. A heterogeneous mixture having one or more solutes dissolved in a solvent
 - D. A pure compound having a solute and a solvent mixed in a fixed ratio by mass

7. A sugar solution is prepared by dissolving 10 g of sugar in 55 g of water.

The mass percent of solvent (water) in the given solution is

- A. 15.38%.
 - B. 18.18%.
 - C. 81.82%.
 - D. 84.62%.
8. Azfer was asked to prepare 0.1 M oxalic acid solution using 3.15 g of oxalic acid in a 250 mL volumetric flask. The lab assistant provided Azfer with a 500 mL flask instead of 250 mL for the same amount of oxalic acid.

What will be the molarity of the solution in the 500 mL flask?

(**Note:** The molar mass of oxalic acid is 126 g mol^{-1} .)

- A. 0.05 M
 - B. 0.07 M
 - C. 0.10 M
 - D. 0.14 M
9. All of the following factors affect the solubility of a solid solute in a solvent EXCEPT
- A. polarity.
 - B. pressure.
 - C. temperature.
 - D. surface area.
10. When dissolved in water, the substance that forms a suspension is
- A. milk.
 - B. alcohol.
 - C. sodium chloride.
 - D. calcium carbonate.
11. The species that does NOT carry an electrical charge is a/ an
- A. anion.
 - B. cation.
 - C. proton.
 - D. neutron.

PLEASE TURN OVER THE PAGE

12. How many protons, neutrons and electrons are present in Be^{2+} ion?

(Note: ${}^9_4\text{Be}$)

	Number of		
	Protons	Neutrons	Electrons
A	4	9	2
B	5	4	3
C	4	5	2
D	5	9	3

13. The commonly used isotope as fuel for nuclear power plants and the nuclear reactors that run naval ships and submarines is

- A. cobalt-60
- B. iodine-131
- C. strontium-90
- D. uranium-235

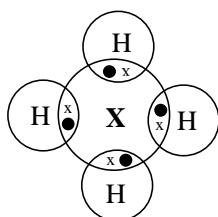
14. Rutherford's gold metal foil experiment proved that the mass and charge of an atom is concentrated in its

- A. orbits.
- B. protons.
- C. nucleus.
- D. electrons.

15. The incompletely filled electronic sub-shell in case of potassium (${}^{39}_{19}\text{K}$) is

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

16. The given dot and cross structure shows valence shell electrons of element **X** and hydrogen.



The group of the periodic table to which element **X** belongs is

- A. IVA.
- B. VA.
- C. VIA.
- D. VIIIA.

17. The following table shows the difference between all the elements of **X** and **Y** families.

Property	X	Y
Reactivity	Unreactive	Reactive
Occurrence	Monoatomic	Diatomic

With reference to the given table, **X** and **Y** families can be identified as

	X	Y
A	noble gases	oxygen group
B	alkali metals	halogens
C	noble gases	halogens
D	alkali metals	oxygen group

18. A metallurgical engineer intends to utilise a group of specific elements exhibiting the following characteristics.

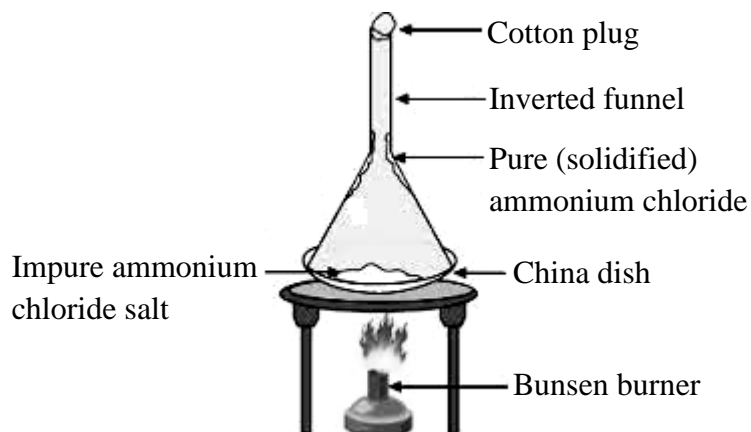
- Soft
- Low melting point
- Highly electropositive

Based on the given characteristics, he would MOST likely use the elements belonging to which block of the periodic table?

- A. s-block
 B. p-block
 C. d-block
 D. f-block
19. A TRUE statement regarding the electronegativity of elements is that
- A. electronegativity value of fluorine is lower than that of chlorine.
 B. electronegativity value of alkali metals is higher than that of alkaline earth metals.
 C. it is the amount of energy required to remove an electron from a gaseous atom or ion.
 D. it is the tendency of an atom in a molecule to attract the shared pair of electrons to itself.
20. A decrease in attraction between the outer electrons and the nucleus of an atom due to the blocking effect of the inner electrons is termed as
- A. shielding effect.
 B. electron affinity.
 C. electronegativity.
 D. ionisation potential.

PLEASE TURN OVER THE PAGE

21. The given diagram shows the process of



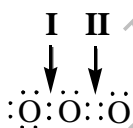
- A. boiling.
 - B. melting.
 - C. sublimation.
 - D. condensation.
22. What happens when 1 mole of a gas expands at a constant temperature?
- A. The pressure of the gas decreases
 - B. The number of molecules of the gas increases
 - C. The intermolecular force of attraction increases
 - D. The kinetic energy of the gas molecules decreases
23. The property of a gas that is measured in g/cm^3 is
- A. mass.
 - B. density.
 - C. volume.
 - D. pressure.
24. The option that shows the CORRECT relationship among intermolecular forces, vapour pressure and boiling point in liquids is

	Intermolecular Forces	Vapour Pressure	Boiling Point
A	strong	low	low
B	strong	high	high
C	weak	low	high
D	weak	high	low

25. The molecular formula of both rhombic and monoclinic sulphur is
- S_2
 - S_4
 - S_6
 - S_8
26. Which of the following statements stands TRUE for the formation of lithium chloride?

(Note: ${}^7_3\text{Li}$ and ${}^{35.5}_{17}\text{Cl}$)

- A lithium atom gives an electron to the chlorine atom.
 - A chlorine atom gives an electron to the lithium atom.
 - A chlorine atom shares an electron with the lithium atom.
 - A lithium atom accepts a pair of electrons from the chlorine atom.
27. Covalent compounds do not conduct electricity because they
- are highly volatile in nature.
 - lack the ability to form ions.
 - readily decompose into elements.
 - have relatively low melting point.
28. Which of the following properties is TRUE for ionic compounds?
- They are malleable and ductile.
 - They have low melting and boiling points.
 - They are brittle and dissolve easily in organic solvents.
 - They dissolve in polar solvents and conduct electricity in molten form.
29. In the given molecule, bonds **I** and **II** are identified as



	I	II
A	Ionic bond	Ionic bond
B	Single covalent bond	Coordinate covalent bond
C	Single covalent bond	Double covalent bond
D	Coordinate covalent bond	Double covalent bond

PLEASE TURN OVER THE PAGE

30. Given are the attributes of a bond.

- It facilitates the formation of an alloy.
- It results in the conduction of electric current.
- It exists between nucleus and electrons of atoms of the same element.

The type of bond is

- A. ionic.
- B. dative.
- C. metallic.
- D. covalent.

31. The term, 'oxidation' of a substance means

- A. gain of electron and loss of oxygen atom.
- B. gain of oxygen atom and loss of electron.
- C. gain of electron and loss of hydrogen atom.
- D. gain of hydrogen atom and loss of electron.

32. To prevent underground iron pipes from rapid corrosion, blocks of metal **X** are buried close to the pipes and connected by wires. This is called sacrificial protection.

The metal **X** is

- A. lead.
- B. gold.
- C. silver.
- D. magnesium.

33. Ebrahim observes that the bulb connected to an electrolytic cell does not glow when ethanol is placed in the cell. He infers ethanol to be a non-electrolyte because it

- A. is highly volatile in nature.
- B. stays as molecules in a solution.
- C. has relatively low melting point.
- D. becomes solvated by water molecules.

34. During the electrolysis of brine (concentrated solution of sodium chloride and water), the substance that is produced at the anode is

- A. H_2
- B. Na
- C. Cl_2
- D. H_2O

35. In the presence of oxygen and moisture from the air, iron corrodes and forms

- A. iron oxide.
- B. iron nitrate.
- C. iron chloride.
- D. iron sulphate.

36. Which of the following statements is FALSE for soft metals?
- A. They are easy to break.
 - B. They have low binding energies.
 - C. They belong to d-block of the periodic table.
 - D. They have less delocalised electrons than hard metals.
37. Phosphorus depicts all of the following characteristics EXCEPT that it can exist
- A. in several allotropic forms.
 - B. as a multivalent non-metal.
 - C. as a free element on the Earth.
 - D. as a waxy and colourless solid.
38. The characteristic of non-metals that contributes to their inability to conduct heat effectively is
- A. low density.
 - B. high melting point.
 - C. lack of free electrons.
 - D. high thermal expansion.
39. What happens when a piece of calcium metal is added to water?
- A. It gives double displacement reaction with water.
 - B. It floats on the surface and does not react with water.
 - C. It forms calcium oxide with a characteristic orange flame.
 - D. It produces calcium hydroxide and liberates hydrogen gas.
40. Which of the following displacement reactions can occur based on the oxidising power of halogens?
- A. $F_2 + 2KI \rightarrow I_2 + 2KF$
 - B. $I_2 + 2KCl \rightarrow Cl_2 + 2KI$
 - C. $Br_2 + 2KF \rightarrow F_2 + 2KBr$
 - D. $Br_2 + 2KCl \rightarrow Cl_2 + 2KBr$

END OF PAPER

Please use this page for rough work

AKU-EB
Annual Examinations 2025
for Teaching & Learning only

Please use this page for rough work

AKU-EB
Annual Examinations 2025
for Teaching & Learning only

Please use this page for rough work

AKU-EB
Annual Examinations 2025
for Teaching & Learning only