

APOLLO

Salts

FBISE Chemistry Class 10 (SSC-II)

Domain B: Physical Chemistry

23 questions | questions

Original FBISE question crops. National Curriculum 2022-23 topic.

Q1. Fill the relevant bubble against each question according to the curriculum. Each part carries one mark.

	Question	A	B	C	D	A	B	C
i	A student places a piece of dry ice (solid CO ₂) in a sealed container. After a while, the container expands and may even burst. What is the best explanation for this?	The dry ice melted and turned into liquid, increasing volume.	The dry ice reacted with oxygen to form new compounds	The dry ice sublimed, producing gas that increases pressure.	The container absorbed external heat, causing it to burst	☐	☐	☐
ii	What is the direction of flow of electrons in an electrolytic cell?	Anode to cathode externally	Anode to cathode internally	Cathode to anode externally	Cathode to anode in the solution	☐	☐	☐
iii	In the following reaction, $\text{N}_{2(g)} + 3\text{H}_{2(g)} \rightleftharpoons 2\text{NH}_{3(g)}$ Which physical factor has the greatest impact on the reaction rate as the reaction progresses?	Temperature	Catalyst	Concentrations	Volume	☐	☐	☐
iv	Which cations generally form soluble salts in water?	Sodium (Na ⁺), Potassium (K ⁺), and Ammonium (NH ₄ ⁺)	Silver (Ag ⁺), Lead (Pb ²⁺), and Mercury (Hg ²⁺)	Barium (Ba ²⁺), Calcium (Ca ²⁺), and Strontium (Sr ²⁺)	Iron (Fe ²⁺), Copper (Cu ²⁺), and Zinc (Zn ²⁺)	☐	☐	☐

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v	The products of the reaction of an acid with an insoluble base are?	Salt + CO ₂	Salt + O ₂	Salt + H ₂ O	Salt + H ₂	☐	☐

Q. 2	Attempt the following questions (10x3 = 30)			
(i)	Based on the given standard electrode potential (E°) values, arrange the following metals in order of increasing reactivity. Explain how electrode potential relates to metal reactivity. $\text{Mg}^{2+} + 2e^- \rightarrow \text{Mg} \quad E^\circ = -2.37$ $\text{Cu}^{2+} + 2e^- \rightarrow \text{Cu} \quad E^\circ = +0.34$ $\text{Ni}^{2+} + 2e^- \rightarrow \text{Ni} \quad E^\circ = -0.25$	1+2	OR	A gas sample has a volume of 72 dm^3 at room temperature and pressure. How many moles of gas does it contain? 03
(ii)	The Contact Process is an industrial method for sulfuric acid production. a. Write the balanced symbol equation for conversion of sulfur dioxide to sulfur trioxide in the Contact process. b. Identify the sources of sulfur dioxide and oxygen in this process. c. What are the typical conditions for the conversion of sulfur dioxide to sulfur trioxide?	1+1 +1	OR	a. What is molarity? How can you convert molarity to g/dm^3 ? b. What is the molarity of a solution made by dissolving 98 g of H_2SO_4 in 1 dm^3 of water? (Molar mass of $\text{H}_2\text{SO}_4 = 98 \text{ g/mol}$) 1.5 1.5
(iii)	A sample of calcium carbonate (CaCO_3) contains 20 grams of calcium. What is the mass of carbon dioxide (CO_2) produced when the calcium carbonate is heated?	03	OR	Draw structural formula of following a. Pent-2-ene b. But-1-ol c. Pentanoic acid 1+1 1
(iv)	a. What is a polymer? b. Name the basic building blocks of polymers. c. Which polymer is commonly used to make plastic bottles?	1+1 +1	OR	Draw the structure showing how protein molecule is formed, clearly highlighting the peptide linkages within the structure. 2+1
(v)	Write the chemical equations for the reactions of: a. Zinc with steam. b. Magnesium with hydrochloric acid. c. Sodium with cold water.	1+1 +1	OR	a) What are the reactants in a hydrogen-oxygen fuel cell? b) Which electrode in a hydrogen-oxygen fuel cell undergoes oxidation c) Write the overall reaction equation for a hydrogen-oxygen fuel cell. 03
(vi)	a. What is esterification? Provide a general reaction equation to illustrate the process.	2+1	OR	How does the lattice structure of salts contribute to their physical properties? 03

First Annual 2025 | Section A Q12 | 1 mark

In Solvay process, which two chemicals are dissolved in water to form ammonical brine?	$\text{NH}_3 + \text{HCl}$	$\text{NH}_3 + \text{CO}_2$	$\text{NH}_3 + \text{NaCl}$	$\text{NH}_3 + \text{CaO}$
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First Annual 2025 | Section B Q2(viii) OR | 3 marks

OR	In Solvay process, which reactions occur in carbonating tower? How ammonia recovery takes place? Write reactions.	03
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(x)	Write complete balanced neutralization reaction between phosphoric acid and sodium hydroxide in three steps.	03
	فاسفورک ایسڈ اور سوڈیم ہائیڈرو آکسائیڈ کے درمیان نوٹرلائزیشن ری ایکشن کی مکمل اور	

OR	What is hard water? Write down methods used to remove temporary hardness of water.	06
	سخت پانی کیا ہے؟ لکھیں۔ سخت پانی کو دور کرنے کے لیے استعمال کیے جانے والے طریقے	

OR	In Solvay process, which reactions occur in carbonating tower? How does ammonia recovery take place? Write reactions.	03
	سولوی کے عمل میں کاربونیٹنگ ٹاور میں ہونے والے ری ایکشن لکھیں۔ آمونیا کی بازیابی کیسے ہوتی ہے؟	

(x)	Write complete balanced neutralization reaction between carbonic acid and potassium hydroxide in two steps.	03
	کاربنک ایسڈ اور پوٹاشیم ہائیڈرو آکسائیڈ کے درمیان نوٹرلائزیشن ری ایکشن کی مکمل اور	

	What are Arrhenius acid and Arrhenius base? Classify HNO_3 , H_2SO_4 , $NaOH$ and KOH as Arrhenius acid or base with chemical reactions.	06
	آرینیئس ایسڈ اور بیس کیا ہیں؟ HNO_3 ، H_2SO_4 ، $NaOH$ اور KOH کی	

	Which salts make the water hard? For which purpose Clark's method and ion-exchange method are used? Elaborate your answer.	06
	کون سے نمک پانی کو سخت بناتے ہیں؟ کلرک کا طریقہ اور آئن ایکسچینج کا مقصد کیا ہے؟	

What type of impurity causes temporary hardness in water?	$CaSO_4$	$NaCl$	$MgCl_2$	$Ca(HCO_3)_2$
7. Which salts make the water hard? For which purpose Clark's method and ion-exchange method are used? Elaborate your answer.				

(iv)	Name two common methods to remove permanent hardness of water. Give chemical equation for any one method.	2+1
	پانی میں دائم سختی کو دور کرنے کے دو عام طریقے لکھیں۔ کسی ایک طریقے کے لیے	

	What is the usual state of ionic compounds under normal conditions? Give two reasons.	1+2
	آئیونک مرکبات نارمل کنڈیشن میں عام طور پر کس حالت میں پائے جاتے ہیں؟ دو وجوہات	

First Annual 2026 | Section A Q5 | 1 mark

Carbonates of _____ are usually soluble in water.	Na, K	Ca, Mg	Fe, Cu	Ag, Pb
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First Annual 2026 | Section A Q6 | 1 mark

Which technique is used to remove excess insoluble solid from salt solution?	Distillation	Evaporation	Crystallization	Filtration
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First Annual 2026 | Section A Q9 | 1 mark

Salts are generally good conductors of electricity in _____ state.	Powdered	Solid	Molten	Gas
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First Annual 2026 | Section B Q2(vi) OR | 3 marks

Why do ionic compounds have high melting points? Give two reasons.	1.5 +
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First Annual 2026 | Section A Q5 | 1 mark

Which chloride is insoluble in water according to solubility rules?	Ammonium chloride	Sodium chloride	Potassium chloride	Silver chloride
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First Annual 2026 | Section A Q6 | 1 mark

When an insoluble carbonate reacts with an acid, which gas is produced?	Carbon dioxide	Hydrogen	Oxygen	Nitrogen
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First Annual 2026 | Section A Q9 | 1 mark

The most suitable method to prepare a soluble salt from an acid and an alkali is:	Distillation	Crystallization	Filtration	Titration
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FBISE model paper | Section A Q1(1) | 1 mark

Q.1 Fill the relevant bubble for each part. Each part carries one mark.

- (1) Which one of the following compounds is formed by the reaction of Aluminium Hydroxide $\text{Al}(\text{OH})_3$ with Sulphuric Acid H_2SO_4 ?
- A. $\text{Al}(\text{SO}_4)_3$ B. Al_2CO_3
 C. $\text{Al}_2(\text{SO}_4)_3$ D. AlCl_3

Q.2 Attempt all parts from the following. All parts carry equal marks. (11 × 3 = 33)

i. Classify the following substances as Lewis acids or Lewis bases.

(1+1+1)

a. AlBr_3 b. $\text{CH}_3\text{-CH}_2\text{-OH}$ c. CN^{-1}

OR

Write down balanced chemical equations showing the formation of salt:

(1.5+1.5)

- a. Reaction of HCl acid with Al metal
- b. Reaction of HCl acid with calcium carbonate