

APOLLO

Stoichiometry

FBISE Chemistry Class 10 (SSC-II)

Domain B: Physical Chemistry

23 questions | questions

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

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	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

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

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. $Mg^{2+} + 2e^- \rightarrow Mg$ $E^\circ = -2.37$ $Cu^{2+} + 2e^- \rightarrow Cu$ $E^\circ = +0.34$ $Ni^{2+} + 2e^- \rightarrow Ni$ $E^\circ = -0.25$	1+2	OR	A gas sample has a volume of 1 dm ³ at room temperature and pressure. How many moles of gas does it contain?
(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 do you convert molarity to g/dm ³ ? b. What is the molarity of a solution made by dissolving 98 g of H ₂ SO ₄ in 1 dm ³ of water? (Molar mass of H ₂ SO ₄ = 98 g/mol)
(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 a. Pent-2-ene b. But-1-ol c. Pentanoic acid

First Annual 2025 | Section A Q7 | 1 mark

Concentration of reactants and products in moles dm ⁻³ in a dilute solution represents:	Molecular mass	Molar mass	Atomic mass	Active mass
--	----------------	------------	-------------	-------------

First Annual 2026 | Section B Q2(ii) OR | 3 marks

Calculate the concentration in mol/dm ³ of a solution containing 20 g of NaOH in 1 dm ³ of solution. NaOH کے 20 گرام 1 dm ³ سلوشن میں حل پذیر ہیں۔ اس سلوشن کی کنسنٹریشن mol/dm ³ میں معلوم کریں۔	03
--	----

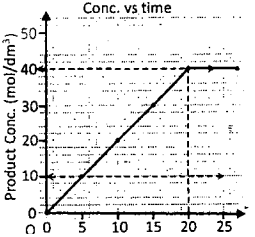
First Annual 2026 | Section B Q2(ix) OR | 3 marks

Calculate the concentration in g/dm ³ of a solution that contains 0.25 mol of KNO ₃ in 1 dm ³ of solution. سلوشن کے ایک dm ³ میں KNO ₃ کے 0.25 مول موجود ہیں۔ اس کی کنسنٹریشن g/dm ³ میں معلوم کریں۔	03
---	----

First Annual 2026 | Section B Q2(viii) OR | 3 marks

The empirical formula of a compound is CH ₂ O. Find its molecular formula if molar mass is 180. ایک کمپاؤنڈ کا امپیریکل فارمولا CH ₂ O ہے۔ اگر اس کا مولر ماس 180 ہو تو اس کا مالیکیولر فارمولا کیا ہوگا؟	03
--	----

Q.4	Classify the following oxides as acidic, basic or amphoteric based on their chemical properties: SO_2, CuO, Al_2O_3 (Give balanced chemical equations) درج آکسائیڈز کو ان کی کیمیائی خصوصیات کی بنیاد پر بطور ایسڈک، بیسک یا ایفونٹریک درج بندی کریں Al_2O_3, CuO, SO_2 (متوازن کیمیائی مساوات بھی لکھیں)	2x3	OR	In given reaction, if 150g Zn reacts with 200g dil. H_2SO_4. (Mr. Zn=63.5 gmol^{-1}) Determine: درج مساوات میں Zn کے 150g کے ساتھ H_2SO_4 کے 200g کا ری ایکشن ہو تو معلوم کریں۔ مولر ماس زنک = 63.5 gmol^{-1} $\text{Zn} + \text{H}_2\text{SO}_4 \longrightarrow 2\text{ZnSO}_4 + \text{H}_2$ <table><tr><td>a.</td><td>Limiting Reactant</td><td>لمیٹنگ ری ایکٹنٹ</td></tr><tr><td>b.</td><td>Mass of H_2 produced</td><td>بننے والی H_2 کا ماس</td></tr></table>	a.	Limiting Reactant	لمیٹنگ ری ایکٹنٹ	b.	Mass of H_2 produced	بننے والی H_2 کا ماس
a.	Limiting Reactant	لمیٹنگ ری ایکٹنٹ								
b.	Mass of H_2 produced	بننے والی H_2 کا ماس								

Q.5	C = 38.71%, H = 9.68% O = 51.61% Calculate the empirical and molecular formulas of given compound from the given data if its Molar Mass is 62 g/mol. دنی گنی معلومات سے مذکورہ کمپاؤنڈ کا امپیریکل اور امپیٹریکل فارمولا نکالیں جبکہ (مولر ماس: 62g/mol)	06	OR	a. What does the rate of reaction mean? How it can be measured? b. Calculate the rate of reaction between 5 and 20 sec in given graph. c. What does the horizontal line at the end of graph indicate?	 2x3
-----	---	----	----	--	--

Maximum amount of product in a reaction is determined by:	Limiting reactant	Reactant in excess	Catalyst	Solvent
--	-------------------	--------------------	----------	---------

Calculate the concentration in mol/dm^3 of a solution containing 10 g of NaCl in 1 dm^3 of solution. NaCl کے 10 گرام 1 dm^3 سلوشن میں حل پذیر ہیں۔ اس سلوشن کی کنسنٹریشن mol/dm^3 میں معلوم کریں۔	03
---	----

The empirical formula of a compound is CH_2O. Find its molecular formula if molar mass is 180. ایک کمپاؤنڈ کا امپیریکل فارمولا CH_2O ہے۔ اگر اس کا مولر ماس 180 ہو تو اس کا مالیکیولر	OR
---	----

Calculate the concentration in mol/dm^3 of a solution containing 9.8 g of (H_2SO_4) in 0.5 dm^3 of solution. ایک سلوشن کے 0.5 dm^3 میں H_2SO_4 کے 9.8g موجود ہیں۔ اس کی کنسنٹریشن mol/dm^3 میں معلوم کریں۔	03
--	----

In given reaction, if 68.1g CaCO_3 reacts with 51.6g HCl . Determine:	درج ایکشن میں 68.1g کے CaCO_3 کے ساتھ 51.6g کے HCl کی ایکشن ہو تو معلوم کریں۔			Classify the following oxides as acidic, basic or amphoteric based on their chemical properties SO_2 , CuO , Al_2O_3 . Give balanced chemical equations
$\text{CaCO}_3 + 2\text{HCl} \rightarrow \text{CaCl}_2 + \text{CO}_2 + \text{H}_2\text{O}$		3+3	OR	
a	Limiting Reactant			درج شدہ آکسائیڈز کی ان کی کیمیائی خصوصیات کی بنیاد پر بطور ایسڈک، بیسیک یا امفیوٹیرک درجہ بندی کریں SO_2 , CuO , Al_2O_3 متوازن کیمیائی مساوات بھی لکھیں۔
b	Mass of CaCl_2 produced			

Q.5	Highlight the Role of chemical kinetics in food industry. (Any four aspects) فوڈ انڈسٹری میں کیمیکل کائینٹکس کے کردار پر تفصیلی روشنی ڈالیں۔ (کوئی سے چار پہلو)	1.5x4	OR	C = 40%, H = 6.67% O = 53.33% Calculate the empirical and molecular formulas of given compound from the given data if its Molar Mass is 90 g/mol. دی گئی معلومات سے مذکورہ کپاؤنڈ کا مائیکو لار اور امپیریکل فارمولا نکالیں جبکہ (مولر ماس: 90g/mol)	06
Q.6	Compare the electrolysis of any halide compound in dilute and concentrated solutions. کسی ہیلائیڈ کپاؤنڈ کی ڈائلوٹ اور کنسنٹریٹڈ سلوشنز میں الیکٹرولیس کا موازنہ کریں۔	2+2	OR	Describe the differences between addition polymerization and condensation polymerization. (Two points each.) ایڈیشن پولیمرائزیشن اور کنڈنسنیشن پولیمرائزیشن کے درمیان فرق بیان کریں۔ (دو دو نکات لکھیں۔)	2

— 2SA-I 26005 (D) —

SUPPLEMENTARY TABLE

Atomic No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Symbol	H	He	Li	Be	B	C	N	O	F	Ne	Na	Mg	Al	Si	P	S	Cl	Ar	K	Ca
Mass No	1	4	7	9	11	12	14	16	19	20	23	24	27	28	31	32	35.5	40	39	40

Maximum amount of product in a reaction is determined by:	Solvent	Reactant in excess	Limiting reactant	Catalyst
---	---------	--------------------	-------------------	----------

The empirical formula of a compound is CH_2O . Find its molecular formula if molar mass is 60.

In a reaction between magnesium and hydrochloric acid, 1.2 g of magnesium reacts with excess acid. Calculate the mass and moles of hydrogen gas produced.

03

Calculate the concentration in mol/dm^3 of a solution containing 10 g of Na_2CO_3 in 1 dm^3 of solution.

OR Na_2CO_3 کے 10 گرام 1 dm^3 سلوشن میں حل پذیر ہیں۔ اس سلوشن کی کنسنٹریشن

03

Q.4	In given reaction, if 159g Na_2CO_3 reacts with 73g HCl . Determine:	درج ایکشن میں Na_2CO_3 کے 159g کے ساتھ HCl کے 73g کاری ایکشن ہو تو معلوم کریں۔	06	OR	Classify CO_2 , CaO and Al_2O_3 amphoteric oxides based properties. Give balanced chemical equation.
	$\text{Na}_2\text{CO}_3 + 2\text{HCl} \longrightarrow 2\text{NaCl} + \text{CO}_2 + \text{H}_2\text{O}$				Al کی ان کی کیمیائی خصوصیات کی بنیاد پر ایسڈک، بیسک اور متوازن کیمیائی مساوات بھی لکھیں۔
	a	Limiting Reactant			لیمیٹنگ ری ایکٹنٹ
b	Mass of NaCl produced	بننے والے NaCl کا ماس			
Q.5	For reactions A and B				$\text{C} = 54.55\%, \text{H} = 9.09\%$

OR	C = 54.55%, H = 9.09% O = 36.36% Calculate the empirical and molecular formulas of given compound from the given data if its Molar Mass is 88 g/mol. دی گئی معلومات سے مذکورہ کپاؤنڈ کا مائیکرو لاور اپیریٹکل فارمولہ نکالیں جبکہ (88g/mol: مولر ماس)	06
----	--	----

Draw structural formula of following a. Pent-2-ene b. But-1-ol c. Pentanoic acid	1+1+ 1
--	----------------------

iii. Chemical Equations:**Calculations:****[01]**a) Find the value of n_1 for Na_2CO_3 and n_2 for HCl from the above chemical equation. $n_1 = \dots\dots\dots$ $n_2 = \dots\dots\dots$ b) Calculate the molarity of Na_2CO_3 by using formula:**[01]**

$$\frac{M_1V_1}{n_1} = \frac{M_2V_2}{n_2}$$

Result:Molarity of Na_2CO_3