

APOLLO

Stoichiometry

FBISE Chemistry Class 9 (SSC-I)

Domain B: Physical Chemistry

31 questions | questions

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

7.	What is the formula of aluminium oxide formed from Al^{3+} and O^{2-} ?	AlO	Al_2O_3	Al_3O_2	AlO_3
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21.	The equation represents the action of dilute nitric acid on copper. $x\text{Cu} + y\text{HNO}_3 \rightarrow x\text{Cu}(\text{NO}_3)_2 + 4\text{H}_2\text{O} + 2\text{NO}$ What are the values of x and y?	$x = 1, y = 4$	$x = 1, y = 8$	$x = 3, y = 4$	$x = 3, y = 8$
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22.	What is the empirical formula of the compound whose molecular formula is P_4O_{10} ?	PO	PO_2	P_2O_5	P_8O_{20}
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23.	What is the mass in grams of 3.0×10^{23} molecules of CO_2 ?	22 g	44 g	66 g	88 g
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24.	Hydrogen and chlorine react as shown. 1 molecule of hydrogen + 1 molecule of chlorine $\rightarrow$ 2 molecule of hydrogen chloride What is the equation for this reaction?	$2\text{H} + 2\text{Cl} \rightarrow 2\text{HCl}$	$2\text{H} + 2\text{Cl} \rightarrow \text{H}_2\text{Cl}_2$	$\text{H}_2 + \text{Cl}_2 \rightarrow 2\text{HCl}$	$\text{H}_2 + \text{Cl}_2 \rightarrow \text{H}_2\text{Cl}_2$
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25.	What is the total number of atoms contained in 2.00 moles of nickel?	3×10^{24}	2.4×10^{24}	6.02×10^{23}	1.2×10^{24}
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OR	Ethane is a saturated hydrocarbon obtained during cracking of larger hydrocarbons and can also be formed by hydrogenation of ethene. Explain why ethane is generally unreactive, yet undergoes combustion and substitution with chlorine, and write simple balanced equations for its preparation from hydrogenation of alkynes and alkyl halides.	2+
		2+
		2

Q7	An unknown solid substance is analysed, and the following properties are recorded: it is a hard crystalline solid with a very high melting point, does not conduct electricity in solid state, but conducts when melted. Using these observations, explain the type of chemical bonding present in the substance and describe how this bonding is formed. Also, relate its bonding and structure to its high melting point and electrical conductivity behaviour.	1
		+
		1
		+
		2
		+
		2

(x)	Find the molar mass of MgO . Also find the number of moles in its 80g sample. MgO کا مولر ماس معلوم کریں نیز اس کے 80g کیل میں مولز کی تعداد معلوم کریں۔	1+2
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Q.5	What is the relationship between Avogadro's number and mole? Also write symbol and value of Avogadro's number.	2+1 +1	OR	What is corrosion? Write its chemical reaction. Describe any one method to prevent corrosion.	1+1 +2

(x)	Determine the molar mass of CO_2 . Also determine mass of 0.25 moles of CO_2 . CO_2 کا مولر ماس معلوم کریں نیز 0.25 مول CO_2 کا ماس بھی بتائیں۔	1+2
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Q.5	Describe following terms with two examples of each: درج شدہ کی وضاحت کریں اور دو مثالیں بھی دیں۔ a) Molecular formula مالیکیولر فارمولا b) Empirical formula ایسریکل فارمولا	2+2	OR	Explain following methods of prevention of corrosion: کوروشن روکنے کے درج طریقے تفصیلاً بیان کریں: a) Sacrificial protection سیکریفیشل پروٹیکشن b) Galvanizing گیلوانائزنگ	2.5 + 1.5
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7. Number of atoms in 2 moles of O ₂ are: دو مول O ₂ میں کتنے ایٹمز ہوتے ہیں؟	3.01 × 10 ²³	6.022 × 10 ²³	1.204 × 10 ²⁴	2.0 × 10 ²³
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(x)	What is a mole? Calculate the number of moles in: مول (Mole) کیا ہوتا ہے؟ درج شدہ میں مولز کی تعداد معلوم کریں۔ a. 48 g of ozone (O ₃) b. 14 g of nitrogen gas (N ₂)	1+2
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2. Avogadro's constant represents the number of molecules in:	0.1 g of H ₂	14 g of N ₂	44 g of CO ₂	10 g of H ₂ O
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refrigerator linked to depletion of ozone layer.					
(i)	Why solids have high density and very low compressibility whereas gases have opposite behavior? Explain briefly.	1.5 +	OR	Calculate the number of moles in a foil of Aluminum that weights 100 g.	03
(ii)	An element exists as two isotopes: • ^{64}X (abundance 30%) • ^{66}X (abundance 70%) Calculate the average relative atomic mass of element X	03	OR	Determine the number of Protons and Neutrons in given Isotopes: a. $^{23}_{11}\text{Na}$ b. $^{37}_{17}\text{Cl}$ c. $^{13}_6\text{C}$	1+1 +1
(v)	Identify the given substances as solution, suspension or colloidal: a. Air b. Sand in water c. Jelly	1+1 +1	OR	Briefly describe: a. How a catalyst affects the reaction rate? b. How a catalyst affects the activation energy?	1+2
(v)	What is meant by 'element'? State one distinguishing feature that separates it from mixtures.	2+1	OR	How is ionic bond formed? Give one example of a compound having ionic bond.	2+1
(vi)	Using the bond energies given below, calculate the enthalpy change (ΔH) for the reaction: $\text{H}_2 + \text{Cl}_2 \rightarrow 2\text{HCl}$ Bond energies: H-H = 436 kJ/mol, Cl-Cl = 242 kJ/mol and H-Cl = 431 kJ/mol	03	OR	Justify the following statements: a. Fluorine has smaller shielding effect than Chlorine b. Fluorine has high ionization energy than Chlorine	1.5 +
(vii)	How is solubility affected by increasing temperature for given solutions: a. KCl in water (endothermic solution) b. Ca(OH)_2 in water (exothermic solution)	1.5 +	OR	$\text{CuSO}_4 \cdot 5\text{H}_2\text{O}_{(\text{blue solid})} \rightleftharpoons \text{CuSO}_4_{(\text{white solid})} + 5\text{H}_2\text{O}$ How heating will affect the equilibrium in given reaction?	03
(viii)	Briefly state the trend of metallic character along the group. Also give reason.	1.5 +	OR	Write chemical reaction when an acid reacts with carbonate. Describe the visible change that may appear.	2+1
(ix)	State the general trends observed down the group for elements of Group-I for their density, and reactivity.	1.5 +	OR	Name the three main types of chemical fertilizers commonly used in agriculture.	1+1 +1
(x)	How are 'dissolved oxygen' and 'essential minerals' beneficial for aquatic life? Describe briefly.	1.5 +	OR	What are substitution reactions? Which type of compounds shows these reactions?	2+1

SECTION – C (Marks 18)**Note: Attempt the following questions.****(3x6=18)**

Q.3	Show covalent bond formation in given molecules using dot-and-cross structures: a. CO_2 b. H_2O c. CH_4	2+2 +2	OR	What is meant by 'molecular formula' and 'structural formula'? Give one example each. Show that $\text{C}_3\text{H}_6\text{O}_2$ can have more than one structural formula.	2+2 1+1
Q.4	Explain the terms 'Acid' and 'Base' according to the Bronsted-Lowry theory. Identify the acid and base in the reaction: $\text{NH}_3 + \text{H}_2\text{O} \rightleftharpoons \text{NH}_4^+ + \text{OH}^-$	2+2 +2	OR	Discuss the functions of carbohydrates and proteins in human body. (any three specific functions each)	3+3
Q.5	Compare metals and non-metals in terms of their: a. Thermal conductivity b. Electrical conductivity c. Malleability and ductility	2+2 +2	OR	How ethane can be prepared by: a. Hydrogenation of alkynes b. Reduction of alkyl Halides	3+3

SUPPLEMENTARY TABLE

— 1SA-I 26005 (B) —

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

Find the mass of 0.5 moles of NaCl.	03	OR	Derive the chemical formula of the compound formed between: a. Mg^{2+} and Cl^- c. Ca^{2+} and NO_3^{-1}	1x3
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The net ionic equation for forming silver chloride is:	$\text{Na}^+ + \text{Cl}^- \rightarrow \text{NaCl}$	$\text{AgNO}_3 + \text{NaCl} \rightarrow \text{AgCl} + \text{NaNO}_3$	$\text{Ag}^+_{(\text{aq})} + \text{Cl}^-_{(\text{aq})} \rightarrow \text{AgCl}_{(\text{s})}$	$\text{Ag}_{(\text{s})} + \text{Cl}_{(\text{g})} \rightarrow \text{AgCl}_{(\text{s})}$

Calculate the number of molecules present in 2 moles of CO_2 .	03
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(vii)	Predict which one of the following pairs has the same mass?	1 mole of N_2O and 1 mole of CO_2	1 mole of H_2 and 1 mole NH_3	1 mole of H_2O and 1 mole of H_2O_2	1 mole of H_2SO_4 and 1 mole of HNO_3
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(ix)	Calculate the number of atoms in each of the following samples. a. 3.4 moles of nitrogen gas b. 15 g of Sodium metal	2+1
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	c. Atomic mass unit	اتامک ماس یونٹ
(ii)	Differentiate between empirical and molecular formula.	

(v)	Demarcate the modern periodic table into 's' and 'p' block. Which law determines this demarcation? جدید پیریائڈک ٹیبل میں 's' اور 'p' بلاک کی نشاندہی کریں۔ ساتھ ہی اس لا کا نام بتائیں جس کی وجہ سے جدید پیریائڈک ٹیبل کی درجہ بندی کی گئی۔	03	OR	G. Sodium chloride in water A flask contains 0.25 M NaOH solution. What mass of NaOH is present per dm^3 of solution? ایک فلاسک میں 0.25 M NaOH سلوشن ہے۔ اس میں NaOH کی کتنی مقدار 1 dm^3 میں موجود ہے؟
(vi)	Recognize and justify the presence of more similar			Sketch a Daniell cell, labelling cathode, anode and

A compound with chemical formula Na_2XO_4 has the formula mass 142 amu. Atomic mass of the element X is:	46	32	16	8
142 amu کے فارمولا Na_2XO_4 والے ایک مرکب کا فارمولا				

OR	Calculate the number of moles in 132g of propane (C_3H_8). 132 گرام پروپین (C_3H_8) میں کتنے مول موجود ہوں گے؟	03
	What is shielding effect? Discuss its trend across	

Q.3	Calculate the number of moles in: a. 3.011×10^{22} molecules of formaldehyde (CH_2O) b. 1.25×10^{22} molecules of benzene (C_6H_6)
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(x)	A student has 0.5 moles of NaCl. Calculate the mass of NaCl in the sample. ایک طالب علم کے پاس 0.5 مول موجود ہیں۔ اس میں NaCl کا اس معلوم کریں۔	03
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.5	Differentiate between empirical and molecular formula. Give examples.
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2.	The atomic mass of Sodium is 23. What is the gram atomic mass of Sodium?	1 g	11.5 g	23 g	46 g
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3.	Avogadro's number represents the number of:	Grams in one mole	Particles in one mole	Litres of gas	Ions in one gram
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OR	Differentiate between an empirical formula and a molecular formula. Give one example for each. انیسپر نیکل فارمولا اور ایکسپر ل فارمولا میں فرق کریں۔ ہر ایک کی ایک مثال دیں۔	1.5 + 1.5
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