

Domains	Content Area	SLO No.	SLO Description	Cognitive Level	Type of Assessment	Remarks	Time allocation (Periods 1Period =40 minutes)
						examination, however it will be a part of Lab work.	
							Total periods =175

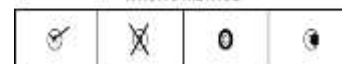
Note: PBA STANDS FOR PRACTICAL BASED ASSESSMENT

PHY/CHEM/BIO/COMP SSC-I

CORRECTLY FILLED



WRONG METHOD



To be filled-in by the Candidate

PAPER VERSION	(A)	(B)	(C)	(D)	(E)
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Time Allowed: 1:20 Hours

Total Marks: 30

Candidate Sign. _____

Invigilator Sign. _____

Question Booklet No. _____

Roll No. _____

FILL ONLY ONE BUBBLE FOR EACH CORRECT ANSWER. USE BLACK BALL POINT/MARKER

1	(A)	(B)	(C)	(D)	16	(A)	(B)	(C)	(D)	31	(A)	(B)	(C)	(D)	46	(A)	(B)	(C)	(D)
2	(A)	(B)	(C)	(D)	17	(A)	(B)	(C)	(D)	32	(A)	(B)	(C)	(D)	47	(A)	(B)	(C)	(D)
3	(A)	(B)	(C)	(D)	18	(A)	(B)	(C)	(D)	33	(A)	(B)	(C)	(D)	48	(A)	(B)	(C)	(D)
4	(A)	(B)	(C)	(D)	19	(A)	(B)	(C)	(D)	34	(A)	(B)	(C)	(D)	49	(A)	(B)	(C)	(D)
5	(A)	(B)	(C)	(D)	20	(A)	(B)	(C)	(D)	35	(A)	(B)	(C)	(D)	50	(A)	(B)	(C)	(D)
6	(A)	(B)	(C)	(D)	21	(A)	(B)	(C)	(D)	36	(A)	(B)	(C)	(D)	51	(A)	(B)	(C)	(D)
7	(A)	(B)	(C)	(D)	22	(A)	(B)	(C)	(D)	37	(A)	(B)	(C)	(D)	52	(A)	(B)	(C)	(D)
8	(A)	(B)	(C)	(D)	23	(A)	(B)	(C)	(D)	38	(A)	(B)	(C)	(D)	53	(A)	(B)	(C)	(D)
9	(A)	(B)	(C)	(D)	24	(A)	(B)	(C)	(D)	39	(A)	(B)	(C)	(D)	54	(A)	(B)	(C)	(D)
10	(A)	(B)	(C)	(D)	25	(A)	(B)	(C)	(D)	40	(A)	(B)	(C)	(D)	55	(A)	(B)	(C)	(D)
11	(A)	(B)	(C)	(D)	26	(A)	(B)	(C)	(D)	41	(A)	(B)	(C)	(D)	56	(A)	(B)	(C)	(D)
12	(A)	(B)	(C)	(D)	27	(A)	(B)	(C)	(D)	42	(A)	(B)	(C)	(D)	57	(A)	(B)	(C)	(D)
13	(A)	(B)	(C)	(D)	28	(A)	(B)	(C)	(D)	43	(A)	(B)	(C)	(D)	58	(A)	(B)	(C)	(D)
14	(A)	(B)	(C)	(D)	29	(A)	(B)	(C)	(D)	44	(A)	(B)	(C)	(D)	59	(A)	(B)	(C)	(D)
15	(A)	(B)	(C)	(D)	30	(A)	(B)	(C)	(D)	45	(A)	(B)	(C)	(D)	60	(A)	(B)	(C)	(D)



Federal Board SSC-I Examination

Chemistry Model Question Paper

National Curriculum 2022-2023 (Inclusive Scheme of Studies 2024)
(50% MCQs & 50% Descriptive)

SECTION - A (Marks 30)

Time Allowed: 1:20 hours

Section – A is compulsory. All parts of this section are to be answered on the OMR Sheet given in the E-Sheet and handed over to the Centre Superintendent. Deleting/ overwriting is not allowed. Do not use lead pencil.

Roll Number							Paper Version
							A

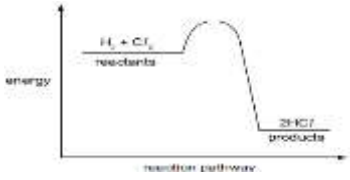
Candidate Sign. _____

Invigilator Sign. _____

Note: Fill the correct bubble for each question on OMR Sheet given in the E-Sheet. Each question carries 0.5 mark.

Q #	Question	A	B	C	D
1.	Diamond is used in cutting tools. The reason for this use is:	It has a layered structure with weak van der Waals forces	It is a highly dense form of pure carbon	It has a strong three-dimensional network structure	It contains delocalized free electrons
2.	Which of the following is a compound?	Air	Iron	Carbon dioxide	Brass
3.	Which of the following combinations is correctly matched?	Sugar + Water → Suspension	Milk → Colloid	Sand + Water → Solution	Air → Suspension
4.	The shells around the nucleus are also called:	Orbitals	Energy levels	Nuclei	
5.	Identify no of electron, protons and neutrons in an element ${}_{58}^{26}X$	25,26,31	26, 26, 26	26, 26, 33	26,26,32
6.	An element contains two isotopes, mass=24, abundance (90%) and mass 25, abundance (10%). The relative atomic mass of the element is.	24.1	24.5	24.9	25.0
7.	What is the formula of aluminium oxide formed from Al^{3+} and O^{2-} ?	AlO	Al ₂ O ₃	Al ₃ O ₂	AlO ₃

8.	Which change is an example of oxidation?	chloride ions to chlorine atoms	copper(II) ions to copper atoms	iron(III) ions to iron(II) ions	oxygen atoms to oxide ions										
9.	In which change is the nitrogen reduced?	NH_3 to NO	NH_3 to NO_3^-	N_2 to NH_3	N^{3-} to N 2										
10.	X and Y are diatomic elements. X is less reactive than Y. What are elements X and Y?	Chlorine and iodine	Fluorine and nitrogen	iodine and bromine	oxygen and nitrogen										
11.	Which pair of properties are both correct for a typical transition element?	Forms coloured compounds and soluble in water	High density and has variable oxidation states	Low density and high melting point	Low melting point and can act as a catalyst										
12.	Which two compounds are members of the same homologous series? 1 $\begin{array}{c} H \\ \\ H-C-O-H \\ \\ H \end{array}$ 2 $\begin{array}{c} H \\ \\ H-C-C(=O)-O-H \\ \quad \\ H \quad O \end{array}$ 3 $\begin{array}{c} H \quad H \\ \quad \\ H-C-C-O-H \\ \quad \\ H \quad H \end{array}$ 4 $\begin{array}{c} H \quad H \\ \quad \\ H-C-O-C-H \\ \quad \\ H \quad H \end{array}$	1 and 2	1 and 3	1 and 4	2 and 4										
13.	Which structure is not an isomer of the structure shown? $CH_3-CH_2-CH_2-CH_2-CH_3$	A $CH_3-CH_2-\underset{\begin{array}{c} \\ CH_3 \end{array}}{CH}-CH_3$	B $\begin{array}{c} CH_3 \\ \\ CH_3-C-CH_3 \\ \\ CH_3 \end{array}$	C $CH_3-CH_2-CH_2-\underset{\begin{array}{c} \\ CH_3 \end{array}}{CH_2}$	D $\begin{array}{c} CH_3-CH-CH_2-CH_3 \\ \\ CH_3 \end{array}$										
14.	Which two elements react together to form an ionic compound? <table border="1" style="width:100%;"><tr><td>element</td><td>Electronic configuration</td></tr><tr><td>W</td><td>2,4</td></tr><tr><td>X</td><td>2,8</td></tr><tr><td>Y</td><td>2,8,1</td></tr><tr><td>Z</td><td>2,8,7</td></tr></table>	element	Electronic configuration	W	2,4	X	2,8	Y	2,8,1	Z	2,8,7	W and X	X and Y	Y and Z	Z and W
element	Electronic configuration														
W	2,4														
X	2,8														
Y	2,8,1														
Z	2,8,7														

15.	The symbols of two atoms may be written as shown. ${}^{52}_{23}\text{X} \quad {}^{52}_{24}\text{Y}$ Which statement about these atoms is correct?	They are different elements because they have different numbers of neutrons.	They are different elements because they have different numbers of protons.	They are isotopes of the same element because they have the same nucleon number.	They are isotopes of the same element because they have the same proton number
16.	The atoms ${}^{64}_{29}\text{Cu}$ and ${}^{65}_{30}\text{Zn}$ have the same	nucleon number	number of electrons	number of neutrons	proton number
17.	Why does molten sodium chloride conduct electricity?	It has free mobile electrons	The ions move freely when bonds break	Heating makes electrons mobile	Sodium becomes a conductive metal
18.	Which of the following changes is endothermic?	$\text{H}_{(\text{g})} + \text{Cl}_{(\text{g})} \rightarrow \text{HCl}_{(\text{g})}$	$\text{H}_2\text{O}_{(\text{g})} \rightarrow 2\text{H}_{(\text{g})} + \text{O}_{(\text{g})}$	$\text{H}_2\text{O}_{(\text{l})} \rightarrow \text{H}_2\text{O}_{(\text{s})}$	$2\text{H} + \text{O} \rightarrow \text{H}_2\text{O}_{(\text{l})}$
19.	The reaction $\text{C}_2\text{H}_4 + 3\text{O}_2 \rightarrow 2\text{CO}_2 + 2\text{H}_2\text{O}$ is exothermic because	more bonds are broken than are formed	more bonds are formed than are broken	the energy needed to break the bonds is greater than that released on forming new bonds	the energy needed to break the bonds is less than that released on forming new bonds
20.	The energy profile diagram for the reaction between hydrogen and chlorine is shown.  What information about the type of reaction and the sign of enthalpy change (ΔH) does the diagram show?	endothermic and negative ΔH	endothermic and positive ΔH	exothermic and negative ΔH	exothermic and positive ΔH
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?	$x = 1, y = 4$	$x = 1, y = 8$	$x = 3, y = 4$	$x = 3, y = 8$
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}

23.	What is the mass in grams of 3.0×10^{23} molecules of CO_2 ?	22 g	44 g	66 g	88 g
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?	$2\text{H} + 2\text{Cl} \rightarrow 2\text{HCl}$	$2\text{H} + 2\text{Cl} \rightarrow \text{H}_2\text{Cl}_2$	$\text{H}_2 + \text{Cl}_2 \rightarrow 2\text{HCl}$	$\text{H}_2 + \text{Cl}_2 \rightarrow \text{H}_2\text{Cl}_2$
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}
26.	Alkanes are a homologous series of organic compounds. Which statement about alkanes is correct?	Their boiling points increase as the length of the carbon chain increases	Their general formula is C_nH_{2n}	They are unsaturated hydrocarbons	They take part in addition reactions
27.	Which of the following groups contain compounds that all belong to the same homologous series?	CH_4 C_2H_6 C_3H_6	CH_4 C_2H_6 C_3H_8	C_2H_4 C_3H_6 C_4H_{10}	C_3H_4 C_3H_6 C_3H_8
28.	Butane and methylpropane are isomers. Which formula is different for the two isomers?	empirical formula	general formula	molecular formula	structural formula
29.	Which gas cannot be removed from the exhaust gases of a petrol-powered car by its catalytic converter?	carbon dioxide	carbon monoxide	hydrocarbons	nitrogen dioxide
30.	Which noble gas is present in the largest percentage by volume in air?	argon	helium	krypton	neon
31.	Ammonia gas is produced when solid ammonium chloride is heated with	calcium hydroxide	calcium sulphate	hydrochloric acid	magnesium nitrate
32.	The following equations represent reactions of dilute sulphuric acid. Which reaction is not 'typical' of a dilute acid?	$2\text{KOH}_{(aq)} + \text{H}_2\text{SO}_{4(aq)} \rightarrow \text{K}_2\text{SO}_{4(aq)} + 2\text{H}_2\text{O}_{(l)}$	$\text{CuO}_{(s)} + \text{H}_2\text{SO}_{4(aq)} \rightarrow \text{CuSO}_{4(aq)} + \text{H}_2\text{O}_{(l)}$	$\text{Pb}(\text{NO}_3)_{2(aq)} + \text{H}_2\text{SO}_{4(aq)} \rightarrow \text{PbSO}_{4(s)} + 2\text{HNO}_{3(aq)}$	$\text{ZnCO}_{3(s)} + \text{H}_2\text{SO}_{4(aq)} \rightarrow \text{ZnSO}_{4(aq)} + \text{CO}_{2(g)} + \text{H}_2\text{O}_{(l)}$
33.	What is the ionic equation for the reaction between zinc and aqueous copper (II) sulfate?	$\text{Zn}^{2+}_{(aq)} + \text{Cu}_{(s)} \rightarrow \text{Zn}_{(s)} + \text{Cu}^{2+}_{(aq)}$	$\text{Zn}^{2+}_{(aq)} + \text{SO}_4^{2-}_{(aq)} \rightarrow \text{ZnSO}_{4(s)}$	$\text{Zn}_{(s)} + \text{CuSO}_{4(aq)} \rightarrow \text{Cu}_{(s)} + \text{ZnSO}_{4(aq)}$	$\text{Zn}_{(s)} + \text{Cu}^{2+}_{(aq)} \rightarrow \text{Zn}^{2+}_{(aq)} + \text{Cu}_{(s)}$

	$Zn_{(s)} + CuSO_{4(aq)} \rightarrow Cu_{(s)} + ZnSO_{4(aq)}$												
34.	A student studies the reversible dehydration equilibrium of a hydrated salt: $CuSO_4 \cdot 5H_2O_{(s)} \rightleftharpoons CuSO_{4(s)} + 5H_2O_{(g)}$ The blue copper(II) sulfate crystals slowly turn into a white powder when heated. The appearance of the white powder indicates that the equilibrium shifted toward:	The forward reaction, which is endothermic	The forward reaction, which is exothermic	The reverse reaction, which is endothermic	The reverse reaction, which is exothermic								
35.	Which series of changes includes both oxidation and reduction?	$C \rightarrow CO \rightarrow CO_2$	$PbO_2 \rightarrow PbO \rightarrow Pb$	$N_2 \rightarrow NH_3 \rightarrow NO$	$C_2H_2 \rightarrow C_2H_4 \rightarrow C_2H_6$								
36.	A colourless gas is passed into each of three different solutions. The results for each solution are shown in the table. <table><tr><td>Solution</td><td>Result</td></tr><tr><td>Potassium iodide</td><td>Stays Colourless</td></tr><tr><td>Acidified potassium dichromate</td><td>Orange to green</td></tr><tr><td>Acidified potassium permanganate</td><td>Purple to colourless</td></tr></table> What is the colourless gas?	Solution	Result	Potassium iodide	Stays Colourless	Acidified potassium dichromate	Orange to green	Acidified potassium permanganate	Purple to colourless	an acid	an alkali	an oxidising agent	a reducing agent
Solution	Result												
Potassium iodide	Stays Colourless												
Acidified potassium dichromate	Orange to green												
Acidified potassium permanganate	Purple to colourless												
37.	Enzymes help in digestion of food in the human body. Enzymes are:	Carbohydrates	Proteins	Lipids	Minerals								
38.	A student tests a solution with litmus paper and it turns blue. The nature of solution is _____ and having pH value of _____:	Acidic and 5	Basic and 10	Acidic and 10	Basic and 5								
39.	Elements in the same group show similar chemical behavior. This similarity is due to:	Same atomic mass	Same number of shells	Same valence electrons	Same neutrons								
40.	Which of the following elements has the largest atomic size?	Fluorine	Oxygen	Chlorine	Bromine								

	STIMULUS/SITUATION/SCENARIO BASED MCQs					
	Scenario for MCQ (41-44)	A research centre has different laboratories. In one lab, scientists study how enzymes work in the human body. In another lab, researchers develop new medicines to treat diseases. In a third lab, radioactive isotopes are used to treat cancer patients				
41.	Scientists studying how enzymes function in the human body are working in which field?	Organic Chemistry	Biochemistry	Analytical Chemistry	Geochemistry	
42.	The development of new medicines to treat diseases belongs to:	Environmental Chemistry	Organic Chemistry	Polymer Chemistry	Physical Chemistry	
43.	The use of radioactive isotopes in cancer treatment is related to:	Nuclear Chemistry	Inorganic Chemistry	Astrochemistry	Analytical Chemistry	
44.	Which of the following best explains why different laboratories are needed in the research center?	Each laboratory is designed exclusively to handle a specific state of matter (solids, liquids, or gases).	Different branches of chemistry focus on different types of problems and applications	Separate laboratories prevent different chemical elements from contaminating each other's equipment	Laboratories are separated randomly without any purpose	
	Scenario for MCQ (45-48)	Ali melts a piece of wax in a test tube by heating it in a water bath. After removing the heat source, he observes that the liquid wax slowly turns back into a solid.				
45.	What is the name of the process when liquid wax turns into a solid?	Condensation	Evaporation	Freezing	Melting	
46.	Why is this change considered a physical change?	A new substance is formed	The chemical composition changes	The change is reversible and no new substance is formed	Heat is released permanently	
47.	During this change, what happens to the particles of wax?	They break into new atoms	They become chemically different	They come closer together without changing identity	They disappear	
48.	Which property remains unchanged during this process?	State	Shape	Chemical composition	Volume	
	Scenario for MCQ (49-52)	A scientist is analyzing an element X. She finds that its atom has 17 protons, 18 neutrons, and 17 electrons.				
49.	What is the mass number of element X?	13	35	18	17	

50.	Which group and period does element X belong to in the Periodic Table?	Group 1, Period 3	Group 17, Period 3	Group 7, Period 2	Group 17, Period 2	
51.	The electronic configuration of element X is:	2, 8, 7	2, 8, 8	2, 7, 8	2, 7	
52.	What is the atomic number of element X?	18	35	17	19	
	Scenario for MCQ (53-56)	A student studies a group of organic compounds: methane (CH₄), ethane (C₂H₆), propane (C₃H₈), and butane (C₄H₁₀). He observes that each compound differs by one carbon atom and shows similar chemical behavior.				
53.	If the student wants to continue the study with the next compound in this exact same group, what should its chemical formula be?	C ₅ H ₁₀	C ₄ H ₁₂	C ₅ H ₁₂	C ₆ H ₁₄	
54.	What is the common difference between successive members?	CH ₂ group	CH ₃ group	C ₂ H ₄ group	H ₂ group	
55.	Why do these compounds show similar chemical properties?	Same molecular mass	Same functional group	Same number of atoms	Same physical state	
56.	Which property shows a gradual change in a homologous series?	Chemical reactivity	Functional group	Boiling point	Type of bonding	
	Scenario for MCQ (57-60)	In a busy city, heavy traffic releases gases like carbon monoxide (CO), carbon dioxide (CO₂), and nitrogen oxides (NO_x). People living near roads often complain of breathing problems.				
57.	Which gas is most dangerous because it binds with haemoglobin?	CO ₂	CO	NO ₂	SO ₂	
58.	Why is carbon monoxide toxic?	It increases oxygen supply	It forms carboxyhemoglobin reducing oxygen transport	It destroys the red blood cells completely upon contact	It damages the lung tissues	
59.	Which gas contributes most to global warming among these?	CO	CO ₂	NO ₂	SO ₂	
60.	What is the main source of nitrogen oxides in cities?	Burning household garbage in residential areas.	Motor vehicles and the combustion of fossil fuels.	Industrial wastewater treatment plants.	The widespread use of air conditioners and refrigerators	



Federal Board SSC-I Examination

Chemistry Model Question Paper

National Curriculum 2022-2023 (Inclusive Scheme of Studies 2024)

(50% MCQs & 50% Descriptive)

Time allowed: 1:40 hours

Total Marks: 30

Note: Answer all parts from Section 'B' and 'C' on the **E-sheet at specifically provided space**. Write your answers on the allotted /given spaces.

SECTION-B [6x3 = 18 Marks]

Q1	A student notices that elements in the Periodic Table follow clear patterns in their size and reactivity instead of changing randomly. Write the names of Group-VII elements. Also, describe the trend in physical state and density of the Group VII elements as you move down the group.	3	OR	State the difference between a compound and a mixture. In your answer, briefly describe the composition of each type of substance.	3
Q2	Compare the variation in reactivity of metals and non-metals using electron behavior.	3	OR	Give in detail the process of electroplating to prevent metals from corrosion	3
Q3	A city shows a sudden rise in respiratory diseases and reduced visibility. Which pollutant is most likely responsible for it, also explain the mechanism by which it affects human health and the environment.	1+2	OR	A young adult plans a balanced diet to maintain good health. Describe three main classes of biomolecules found in food by identifying their common sources along with the recommended daily intake for a young adult.	3
Q4	Describe what happens when HCl reacts with: (a) a sodium metal (b) Na_2CO_3 (c) NaOH	1+1+1	OR	Differentiate between distilled water and tap water and how does the use of carbon improve the quality of drinking water beyond just removing visible impurities?	1+2
Q5	Identify the functional groups in the following compounds: (a) CH_3COOH (b) CH_3CHO (c) $\text{CH}_3\text{CH}_2\text{OH}$	1+1+1	OR	Define a reversible reaction and explain the conditions under which it reaches equilibrium.	1+2
Q6	An element has two atoms: one contains 17 protons and 18 neutrons, while the other contains 17 protons and 20 neutrons. (a) Can these two atoms be considered isotopes of the same element? (b) Predict whether their chemical properties will be similar or different, and justify your answer.	1+2	OR	Define Chemistry. How different states of matter (solids, liquids, gases, and plasma) are involved in chemical interactions.	1+2

SECTION C (2x6=12 Marks)

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	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
Q8	Draw a well-labelled reaction pathway diagram for an exothermic and endothermic reaction, clearly showing reactants, products, activation energy, and enthalpy change with proper labelling. Briefly interpret through energy diagram that how the catalyst affects the energy profile.	2 +2 +2	OR	Calcium ions (Ca^{2+}) combine with chloride ions (Cl^-) to form a compound, and a molecule is shown where one carbon atom is joined with two oxygen atoms. If 11.1 g of the ionic compound and 4.4 g of the molecular substance are given, write the correct formula and name of the ionic compound, find the formula of the molecular substance from its structure, and calculate the number of moles in each sample using the relation $\text{moles} = \text{mass} / \text{molar mass}$.	1+ 1+ 2+ 2