

BOARD OF INTERMEDIATE AND SECONDARY EDUCATION, PESHAWAR

Higher Secondary School Certificate (H.S.S.C.) Examination — Inter Part-I

Inter Part-I	CHEMISTRY Paper – XI (02) (23) · PR XI (02) 23	Fresh / Reappear 2023
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Instructions (printed in Urdu on the sheet): 1. Each question has four circles; fill in only the circle of the correct answer. 2. Use a blue or black pen to fill the circles. 3. Filling more than one circle will be treated as a wrong answer.

SECTION - A

Time Allowed: 20 Minutes

Marks: 18

1	The mass (in grams) of 3 moles of water is..... ☐ 90g ☐ 196g ☐ 36g ☐ 54g
2	The.....spectrum consists of dark lines in a bright background. ☐ Continuous ☐ Line emission ☐ Line absorption ☐ Visible
3	The appropriate condition applied in a discharge tube for the production of cathode rays is..... ☐ High voltage and low pressure ☐ High voltage and high pressure ☐ Low voltage and low pressure ☐ Low voltage and high pressure
4	Both VSEPR theory and VBT fail to show the unpaired electrons in.....molecule. ☐ H ₂ ☐ He ☐ O ₂ ☐ N ₂
5	The triple bond in ethyne molecule consists of.....bonds. ☐ One sigma and two pi ☐ One pi and two sigma ☐ Three pi ☐ Three sigma
6	If a gas having initial volume of 2dm ³ and pressure of 2atm, what will be its new volume when the pressure is increased to 4 atm? ☐ 1 dm ³ ☐ 2 dm ³ ☐ $\frac{1}{2}$ dm ³ ☐ 4 dm ³
7	The process of diffusion and effusion are to be understand best by..... ☐ Boyle's law ☐ Charle's law ☐ Dalton's law ☐ Graham's law
8	Vacuum distillation is carried out under very reduced..... ☐ Pressure ☐ Temperature ☐ Volume ☐ Voltage
9	If NaCl is crystallized from a solution having 10 % urea as impurity in it, it forms.....crystals. ☐ Cubic ☐ Oval ☐ Round ☐ Needle like
10	Which one of the following is the strongest intermolecular force? ☐ Covalent bond ☐ Hydrogen bonding ☐ Dipole-dipole forces ☐ London dispersion
11	In which of the following reactions, the increase in pressure favours the products. ☐ $2\text{SO}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2\text{SO}_3(\text{g})$ ☐ $\text{N}_2\text{O}_4(\text{g}) \rightleftharpoons 2\text{NO}_2(\text{g})$ ☐ $\text{H}_2(\text{g}) + \text{I}_2(\text{g}) \rightleftharpoons 2\text{HI}(\text{g})$ ☐ $\text{PCl}_5(\text{g}) \rightleftharpoons \text{PCl}_3(\text{g}) + \text{Cl}_2(\text{g})$
12	The ionization of NH ₄ OH is suppressed by adding..... ☐ NaCl ☐ HCl ☐ NH ₄ OH ☐ NH ₄ Cl
13	A buffer solution made by mixing a weak base and its salt with a strong acid has pH value..... ☐ More than 7 ☐ Less than 7 ☐ Equal to 7 ☐ Equal to zero
14	If the rate of a chemical reaction is expressed as Rate = K [A] [B] ⁿ , then overall order of reaction is... ☐ n ☐ 1 ☐ n + 1 ☐ n – 1
15	The process in which the water molecules surround and interact with the ions of solute is called.... ☐ Neutralization ☐ Hydration ☐ Hydrolysis ☐ Hydrogenation
16	Which one of the given is not a colligative property? ☐ Lowering of vapour pressure ☐ Elevation of boiling point ☐ Depression in freezing point ☐ Viscosity
17	Enthalpy of combustion of a substance is..... ☐ Always negative ☐ Always positive ☐ Sometime positive or sometime negative ☐ Always zero
18	A cell which produces electric current by redox reaction is called a/an..... ☐ Voltaic cell ☐ Electrolytic cell ☐ Half cell ☐ Standard cell

Note: Time allowed for Section - B and Section - C is 2 Hours and 40 minutes.

SECTION - B

Marks: 40

Answer any TEN questions. Each question carries FOUR marks.

1. What is the volume (in dm^3) of 2.5 moles of Oxygen gas (O_2) at STP?
2. Discuss the importance of dipole moment in determining the geometry of molecules?
3. What is Pauli Exclusion Principle? Explain it with an example.
4. Dalton's law of partial pressure is applicable for non-reacting gases only. Comment over it?
5. The strength of London dispersion forces depend upon the shapes of molecules. Explain it with reason and also give examples.
6. Explain the following with reasons:
(a) Covalent crystals are hard while molecular crystals are soft.
(b) Ionic solids are brittle
7. Equilibrium constant, K_p at 300 K is 0.75. Find K_c at the same temperature for the given reaction. $\text{PCl}_{5(g)} \rightleftharpoons \text{PCl}_{3(g)} + \text{Cl}_{2(g)}$
8. Write chemical equations for the following and also point out the Lewis acids and Lewis bases from the following:
(a) Boron trifluoride and Ammonia (b) Ammonia and H^+
9. Enlist any four applications of Osmosis?
10. How does a catalyst increase the rate of a reaction? Compare a catalyzed and un-catalysed reaction on a potential energy diagram?
11. Write a note on Daniel cell?
12. Define internal energy of a chemical system? What are the possible consequences upon the system when internal energy of a system has increased?
13. Differentiate between the following terms:
(a) Transition state and activated complex (b) Boiling point and evaporation

SECTION - C

Marks: 27

Note: Attempt any THREE questions. All questions carry equal marks.

- Q-14 (a) Draw molecular orbital energy diagram for Oxygen molecule (O_2) and also calculate its bond order? What informations are obtained from its molecular orbital energy diagram and bond order? (5)
(b) Classify the colloids on the basis of interaction between dispersed medium and dispersion medium. (4)
- Q-15 (a) Define quantum numbers. Give the importance of Azimuthal & Magnetic quantum Number. (5)
(b) Why do the gases show deviation from ideal behavior at high pressure & low temperature? (4)
- Q-16 (a) Differentiate between solubility product constant and ionic product of an electrolyte. How the comparison of values of ionic product (IP) and solubility product constant (K_{sp}) help to know whether the solution is saturated, unsaturated or supersaturated? (2+3)
(b) What is anisotropy? Explain it with example? (4)
- Q-17 (a) Derive a relationship between acid ionization constant (K_a) and ionization constant of its conjugate base (K_b)? (5)
(b) Balance the following equations by ion electron method. (2+2)
(i) $\text{I}^- + \text{NO}_2 \rightarrow \text{I}_2 + \text{NO}$ (Acidic Medium)
(ii) $\text{Zn} + \text{Cr}_2\text{O}_7^{2-} + \text{H}^+ \rightarrow \text{Zn}^{2+} + \text{Cr}^{3+} + \text{H}_2\text{O}$ (Acidic Medium)

Notes

1. Typeset from the board paper. Board wording, spelling and notation are reproduced as printed, including slips; nothing has been corrected.
2. The source answer sheet arrived with the bubbles already shaded in. Options are given unmarked; no answer key is included.
3. The Section A instructions are printed in Urdu on the board sheet; an English rendering is given here.
4. Section B on this sheet is numbered Q.1-Q.13 and headed "Answer any TEN questions", without the Q-II label the other years print.
5. Kept as printed: Q.7 "are to be understand best by"; Q.10 lists a covalent bond among intermolecular forces; Section C Q-14(a) "What informations are obtained".