



# CHEMISTRY

## BOOKS - GURUKUL BOOKS & PACKAGING CHEMISTRY (HINGLISH)

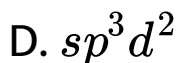
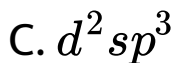
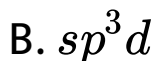
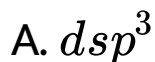
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### Section I

1. Select and write the most appropriate answer from the given alternatives for each

sub-question:

The hybridisation of phosphorus in phosphorus pentachloride is :



**Answer: B**



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2. Select and write the most appropriate answer from the given alternatives for each sub-question:

The rate constant for a first order reaction is  $100\text{S}^{-1}$ . The time required for completion of 50% of reaction is :

- A. 0.0693 millisecond
- B. 0.693 millisecond
- C. 6.93 millisecond
- D. 69.3 millisecond

**Answer: C**



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3. Select and write the most appropriate answer from the given alternatives for each sub-question:

Silica is added to roasted copper ore during smelting process to remove :

A. Ferrous sulphide

B. Ferrous oxide

C. Cuprous sulphide

D. Cuprous oxide

**Answer: B**



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4. Select and write the most appropriate answer from the given alternatives for each sub-question:

96500 coulomb correspond to the charge on how many electrons ?

A.  $1.6 \times 10^{19}$

B.  $6.022 \times 10^{20}$

C.  $6.022 \times 10^{23}$

D.  $6.022 \times 10^{24}$

**Answer: C**



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5. Select and write the most appropriate answer from the given alternatives for each

sub-question:

For the reaction :  $Cl_{2(g)} \rightarrow 2Cl_{(g)}$  :

- A.  $\Delta H$  is positive,  $\Delta S$  is positive
- B.  $\Delta H$  is positive,  $\Delta S$  is negative
- C.  $\Delta H$  is negative,  $\Delta S$  is negative
- D.  $\Delta H$  is negative,  $\Delta S$  is positive

**Answer: A**



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6. Select and write the most appropriate answer from the given alternatives for each sub-question:

The substance 'X', when dissolved in solvent water gave molar mass corresponding to the molecular formula ' $X_3$ '. The van't Hoff factor (i) is :

A. 3

B. 0.33

C. 1.3



D. 1

**Answer: B**



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7. Select and write the most appropriate answer from the given alternatives for each sub-question:

The relation  $a \neq b \neq c$  and  $\alpha \neq \beta \neq \gamma$  represents which crystal system?

A. Orthorhombic

B. Tetragonal

C. Triclinic

D. Monoclinic

**Answer: C**



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**8. Define ebullioscopic constant. Write its unit.**



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**9. State :** (a) Second law of thermodynamics in terms of entropy.

(b) Third law of the thermodynamics.



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**10. What is the hybridisation of carbon atom in diamond and graphite? 0.1 mole of Buckminster fullerene contains how many kg of carbon ? [Atomic mass of carbon =12]**



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**11.** Draw structures of (a) Chlorine trifluoride  
(b) Chlorine pentafluoride.



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**12.** Derive an expression for maximum work in isothermal reversible expansion of two mole of an ideal gas.



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**13.** Can copper sulphate solution be stored in an iron vessel ? Explain.



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**14.** Define : (a) Average rate of reaction  
(b) Instantaneous rate of reaction.



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**15. Define :** (a) Hydrometallurgy

(b) Electrometallurgy.



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**16. What is the action of dioxygen on :**

(a) Calcium (b) Iron

(c) Carbon disulphide ?



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**17.** A solution of glucose in water is labelled as 10 percent  $w/w$ , what would be the molality and mole fraction of each component in the solution? If the density of the solution is  $1.2 \text{ gmL}^{-1}$ , then what shall be the molarity of the solution?



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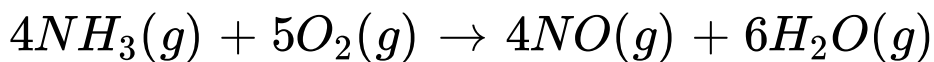
**18.** The resistance of a conductivity cell filled with  $0.1 \text{ MKCl}$  solution is  $100 \Omega$ . If  $R$  of the

same cell when filled with  $0.02M KCl$  solution is  $520\Omega$ , calculate the conductivity and molar conductivity of  $0.02M KCl$  solution. The conductivity of  $0.1M KCl$  solution is  $1.29Sm^{-1}$ .



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**19.** Ammonia and oxygen react at high temperature as:



In an experiment, the rate of formation of  $NO$



is  $3.6 \times 10^{-3} \text{Ms}^{-1}$ . Calculate (a) the rate of disappearance of ammonia and (b) the rate of formation of water.



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**20.** What is the effect of temperature on solubility of gas in a liquid?

Explain refining of nickel of Mond process.

State Kohlrausch's law of independent migration of ions.

Silver crystallises in F.C.C. (face-centred cubic

crystal) structure. The edge length of the unit cell is found to be 408.7 pm. Calculate density of the unit cell.

[Given : Molar mass of silver is  $108\text{g mol}^{-1}$ ]



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21. Write 'four' uses of hydrochloric acid. ,

Write chemical formula of the following

oxoacids of chlorine :

(a) Hypochlorous acid (b) Chlorous acid

(c) Chloric acid (d) Perchloric acid



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## Section II

1. Select and write the most appropriate answer from the given alternatives for each sub-question :

Which among the following reducing agent is 'not' used to reduce acetaldehyde to ethyl alcohol?

A. Na-Hg and water

B. Zn-Hg and conc. HCl

C.  $H_2$ -Raney Ni

D.  $Li - AlH_4 / H^+$

**Answer: B**



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2. Select and write the most appropriate answer from the given alternatives for each sub-question :

Acetaldehyde, when treated with which among

the following reagents does 'not' undergo addition reaction?

A. Ammonia

B. Hydroxyl amine

C. Ammonical silver nitrate

D. Semicarbazide

**Answer: C**



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3. Select and write the most appropriate answer from the given alternatives for each sub-question :

What is natural rubber?

- A. Cis-1, 4-polyisoprene
- B. Neoprene
- C. Trans-1, 4-polyisoprene
- D. Butyl rubber

**Answer: A**



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4. Select and write the most appropriate answer from the given alternatives for each sub-question :

What is salvarsan ?

- A. An antiseptic
- B. An antibiotic
- C. An antifertility drug
- D. An analgesic

**Answer: B**



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5. Select and write the most appropriate answer from the given alternatives for each sub-question :

Which among the following vitamins is also known as riboflavin?

A.  $B_1$

B.  $B_2$



C.  $B_6$

D.  $B_{12}$

**Answer: B**



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6. Select and write the most appropriate answer from the given alternatives for each sub-question :

The amine which reacts with nitrous acid to give yellow oily compound is :

A. Ethyl amine

B. Isopropyl amine

C. Secondary butyl amine

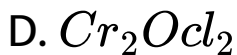
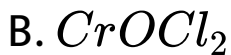
D. Dimethyl amine

**Answer: D**



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7. Select and write the most appropriate answer from the given alternatives for each sub-question :

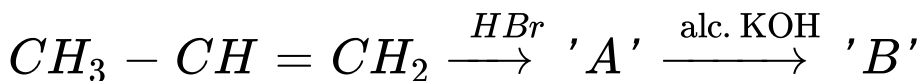


**Answer: A**



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**8. Identify 'A' and 'B' in the following reaction :**



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**9.** Lanthanoids and actinoids.

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**10.** How are the following compounds prepared ?

(a) Benzyl alcohol from benzyl chloride.

(b) Propan-1-ol from propanal.

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**11.** What is the action of acetic anhydride on :

(a) Ethyl amine ?

(b) Diethyl amine ?



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**12.** What are monosaccharides ? Draw ring structure of  $\alpha - D - (+)$ -glucopyranose ?



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**13.** Define the following:

(a) Cationic detergents ItBrgt (b) Broad spectrum antibiotics

(c) Tranquilizers



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**14.** What is Stephen reaction ?



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**15.** Explain sidgwick's electronic theory with suitable example.



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**16.** What is the action of nitrous acid on :

- (a) Primary nitroalkane
- (b) Secondary nitroalkane
- (c) Tertiary nitroalkane



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**17.** What is peptide linkage? How is tripeptide formed?



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**18.** Write the reactions involved in the preparation of:

(a) Teflon (b) Orlon (c) PVC



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**19.** What is the position of iron ( $Z=26$ ) in periodic table?



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**20.** Discuss the mechanism of alkaline hydrolysis of bromomethane.

How is carbolic acid prepared from chlorobenzene? What is the action of bromine water on carbolic acid?

Write chemical test to distinguish between carbolic acid and alcohol.



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21. Explain cationic complexes and anionic complexes of coordination compounds.

write the structure and IUPAC names of isomeric aldehyde having molecular formula  $C_6H_{10}O$ .

Draw the structure of aspirin.



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