



# CHEMISTRY

## BOOKS - EDUCART PUBLICATION

### SAMPLE PAPER 3

#### Section A

1. Which of the following does not directly react with oxygen?

A. Zn

B. Ti

C. PC

D. Fe

**Answer: C**



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2. Example of a network covalent solid is :

A.  $SO_2$  (solid)

B.  $H_2O$  (Ice)

C.  $I_2$

D. Diamond

**Answer: D**



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3. The value of Van't Hoff factors for  $K_2SO_4$ ,  $NaCl$  and  $KCl$  is:

A. 2, 2,2

B. 3, 2,2

C. 2,2,3

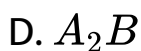
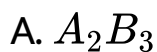
D. 3, 3,2

**Answer: B**



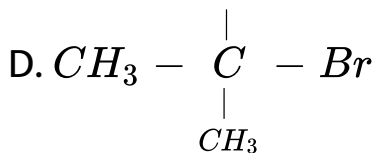
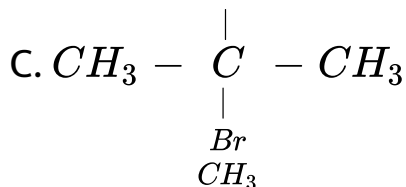
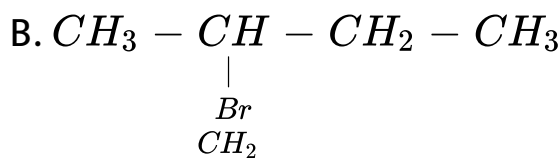
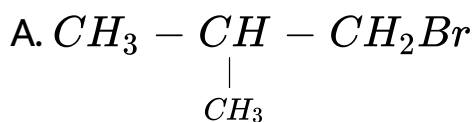
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4. In a face centred cubic lattice, atom  $A$  occupies the corner positions and atom  $B$  occupies the face centred positions. If one atom of  $B$  is missing from one of the face centred points,, the formula of the compound is :



**Answer: C**

5. Among the following which compound has lowest boiling point?



Answer: D

6. In an alkaline medium, glycine predominantly exists as/in a/an

A. covalent form

B. Zwitter ion

C. anion

D. cation

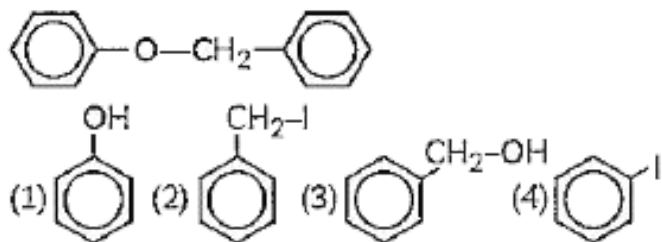
**Answer: C**



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7. What product is obtained when:

The given ether reacts with cold HI gives:



A. mixture of 3 and 4

B. mixture of 2 and 3

C. mixture of 1 and 2

D. mixture of 1 and 4

**Answer: C**



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8.  $SO_2$  reacts with  $Cl_2$  in the presence of sun light to form.

A. Sulphuryl Chloride

B. Sulphoryl Chloride

C. Sulphur Trioxide

D. Sulphur Dioxide

**Answer: A**



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9. Acid catalysed hydration of alkenes except ethene leads to the formation of

- A. mixture of Secondary and tertiary alcohols
- B. secondary or tertiary alcohol
- C. mixture of primary and secondary alcohol
- D. primary alcohol

**Answer: B**



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10. Among the given crystal, which is a covalent crystal?

A. Rock salt

B. Dry ice

C. Quartz

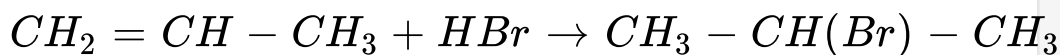
D. Ice

**Answer: C**



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11. What type of reaction is involved the reaction



?

- A. Nucleophilic addition
- B. Electrophilic substitution
- C. Electrophilic addition
- D. Free radical addition

**Answer: C**



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12. Considering the formation, breaking and strength of hydrogen bond, predict which of the following mixtures will show positive deviation from Raoult's law?

- A. Benzene and acetone
- B. Chloroform and benzene
- C. Hydrochloric acid and water
- D. Acetone and aniline

**Answer: A**



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13. Which the following is the most weakest acid?

A. p-cresol

B. m-cresol

C. Phenol

D. o-cresol

**Answer: D**



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14. The least acidic among  $\text{HClO}$ ,  $\text{HBrO}$ ,  $\text{HIO}$  is:

A.  $\text{HIO}$

B.  $\text{HBrO}$

C.  $\text{HClO}$

D.  $\text{HIO}_2$

**Answer: A**



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**15.** In globular proteins:

A. polypeptide chains are arranged as coil

B. spherical in shape

C. water soluble

D. all of these

**Answer: D**



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**16.** What will be the major product when 2-bromopentane is treated with alc. KOH:

A. But-2-ene

B. Pent-2-ene

C. Pent-1-ene

D. 2-methylbut-ene

**Answer: B**



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17. Name the process of converting alkyl halides into alcohols:

A. dehydrogenation reaction

B. substitution reaction

C. addition reaction

D. rearrangement reaction

**Answer: B**



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18. In solid state PCl, is a .....

A. covalent solid

B. octahedral structure

C. ionic solid with  $[PCl_6]^+$  octahedral and

$[PCl_4]^+$  tetrahedral

D. ionic solid with  $[PCl_4]^-$  tetrahedral and

$[PCl_6]^+$  octahedral

Answer: D



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19. The value of  $K_b$  depends upon the:

- A. nature of the solvent
- B. nature of the solute
- C. nature of the solution
- D. Both (b) and (c)

**Answer: A**



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20. Which of the following bond is the strongest?

- A. F-F

B. Cl-Cl

C. Br-Br

D. I - I

**Answer: B**



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**21.** Which one of the following pairs is the essential component of our food?

A. Proteins and nucleic acids

B. Proteins and lipids

C. Nucleic acids and lipids

D. Proteins and carbohydrate

**Answer: D**



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22. The halides of alkali metals are less ionic. Which of the following is least ionic:

A. MF

B. MCL

C. MBT

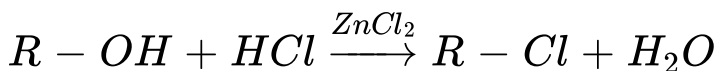
D. MI

Answer: D



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23. What is the correct order of reactivity of alcohols in the following reaction ?



A.  $1^\circ > 2^\circ > 3^\circ$

B.  $3^\circ > 1^\circ > 2^\circ$

C.  $3^\circ > 2^\circ > 1^\circ$

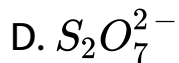
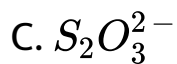
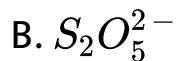
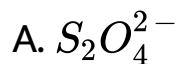
D.  $1^\circ < 2^\circ > 3^\circ$

Answer: C



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24. In which of the following S - S bond is not present:



Answer: D



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25. Which of the following factors do not affect the conductivity of a solution?

- A. Nature of electrolyte
- B. Concentration of the solution
- C. Temperature
- D. Pressure

**Answer: D**



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1. 50 mL of an aqueous solution of glucose  $C_6H_{12}O_6$  (Molar mass : 180 g/mol) contains  $6.02 \times 10^{22}$  molecules. The concentration of the solution will be?

A. 0.1 M

B. 0.2 M

C. 1.0 M

D. 2.0M

**Answer: C**



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2. A grignard reagent may be made by reacting magnesium with

A. Methyl amine

B. Diethyl ether

C. Ethyl iodide

D. Ethyl alcohol

**Answer: C**



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3. Number of non-bonding electron pair of Xe in  $XeF_4$  and  $XeF_2$  respectively is

A. 6,4

B. 3,2

C. 2,3

D. 1, 2

**Answer: C**



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4. Insulin has:

- A. primary structure
- B. secondary structure
- C. tertiary structure
- D. quaternary structure

**Answer: D**



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5. When phenol reacts with bromine in  $CS_2$  at a low temperature, the product is :

- A. 2, 4, 6-tribromophenol
- B. p-bromophenol

C. m-bromophenol

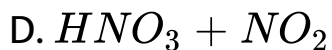
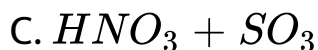
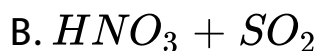
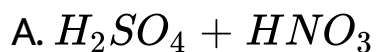
D. cyclohexanone

**Answer: B**



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6. Fuming nitric acid is a mixture of.



**Answer: D**



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7. The defect shown by ZnS is

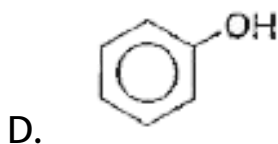
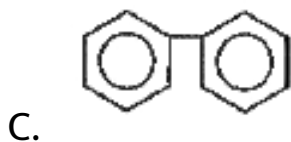
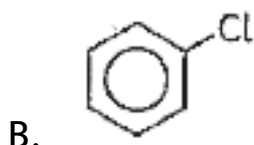
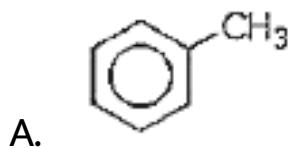
- A. Frenkel defect
- B. Schottky defect
- C. Non-stoichiometric defect
- D. Both (a) and (b)

**Answer: A**



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8. Identify the end product (P) in the following sequence of reactions:



**Answer: C**



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9. Except oxygen, all the elements of group 16 exist as ..... solids.

A. diatomic

B. triatomic

C. octatomic

D. tetraatomic

**Answer: C**



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10. The compressed air used by sea divers comprises:

A.  $He$ ,  $N_2$ ,  $O_2$

B.  $N_2$ ,  $He$

C.  $O_2$ ,  $N_2$

D.  $He$ ,  $O_2$

**Answer: C**

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11. The IUPAC name of isobutyl alcohol is:

A. 1-methylpropanol



B. 2-methylpropan-1-ol

C. ethane 1,2-diol

D. butan-1-ol

**Answer: A**



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**12.** When ethyl bromide reacts with silver cyanide, the main product will be:

A. Ethyl cyanide

B. Ethyl isocyanide

C. Ethene

D. Ethanol

**Answer: B**



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**13.** The radius of an atom of an element is 600 pm. If it crystallizes as a face centred cubic lattice, what is the length of the side of the unit cell?

A.  $a = 1696.8$  pm

B.  $a = 16.9$  pm

C.  $a = 164$  pm

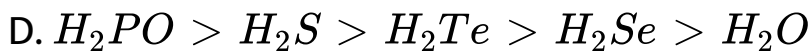
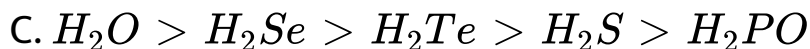
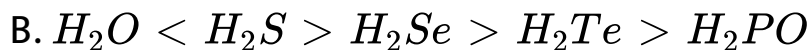
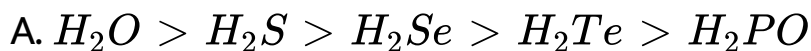
D.  $a = 1685.3$  pm

**Answer: B**



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**14.** The order of thermal stability of hydrides of group 16 elements is?

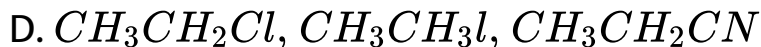
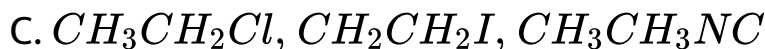
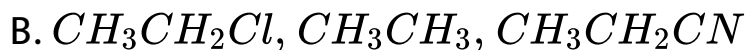
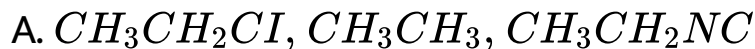
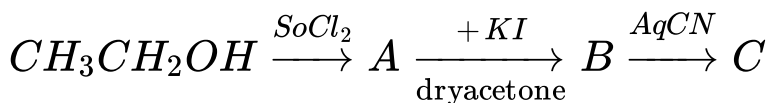


**Answer: A**



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15. Identify A, B and C in the following reaction sequence compounds : .

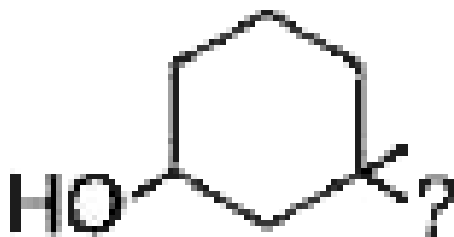


**Answer: A**



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16. What is the IUPAC name of the compound :



- A. 1,1 - dimethyl - 3 - cyclohexanol
- B. 1,1 - dimethyl - 3- hydroxy cyclohexanol .
- C. 3,3-dimethyl -1- cyclohexanol .
- D. 3,3-dimethyl-1-hydroxy cyclohexanol .

**Answer: C**

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17.  $N_2O$  does not used.

A. as a propellant for whipped ice cream

B. as an anesthetic

C. for the preparation of  $N_3H$

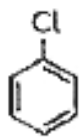
D. as fuel for rockets.

**Answer: C**

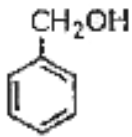


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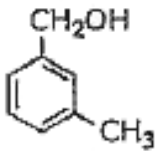
18. Identify the compounds which is aromatic alcohol ?



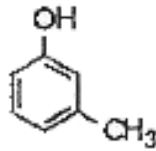
(A)



(B)



(C)



(D)

A. A

B. A,D

C. B,C

D. A,B,C,D

**Answer: C**



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19. Which of the following species attacks the benzene ring in this reaction when chlorobenzene is formed by reaction of chlorine with benzene in the presence of  $AlCl_3$



**Answer: B**



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**20. Assertion (A):** In F-F bond dissociation enthalpy is less.

**Reason (R):** This is due to the presence of lone pairs of electrons.

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is not the correct explanation of A

C. A is true but R is false

D. A is false but R is true

**Answer: B**



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21. Assertion (A): 3-bromopropene is example of alkyl halides.

Reason (R): These are the compounds in which the halogen atom is bonded on an  $sp^2$  hybridized carbon atom.

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is not the correct explanation of A

C. A is true but R is false

D. A is false but R is true

**Answer: A**



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**22.** Assertion (A): Henry's law and Raoult's law are not independent, i.e., one can be derived from the other.

Reason (R ): The partial pressure is directly proportional to the mole fraction of the concerned species for ideal solutions.

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is not the correct explanation of A

C. A is true but R is false

D. A is false but R is true

**Answer: A**



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**23. Assertion (A):** LiF is ionic in nature.

**Reason (R):** LiI is covalent in nature.

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is not the correct explanation of A

C. A is true but R is false

D. A is false but R is true

**Answer: B**



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**24.** Assertion: Osmosis does not take place in two isotonic solutions separated by semipermeable membrane.

Reason : Isotonic solutions have same osmotic pressure

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is not the correct explanation of A

C. A is true but R is false

D. A is false but R is true

**Answer: A**



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## Section C

1. Match the following :

Column I		Column II	
(I)	Most abundant protein	(A)	Chitin
(II)	Basic amino acid	(B)	Ribozyme
(III)	Polysaccharide	(C)	Collagen
(IV)	Phosphodiester bond	(D)	Lysine
(V)	Non proteinaceous enzymes		

Which of the following is the best matched options ?

A. (I) - (B) , (II)-(C) , (III) - (A),(IV)-(D)

B. (I)-(C) , (II) - (D) , (III)-(A),(IV) - (B)

C. (I) - (C) , (II) - (D) , (III) - (A) , (IV) - (B)

D. (I) - (D) , (II) -(A) , (III) - (B) ,(IV) - ( C)

**Answer: B**



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2. Which of the following analogies is correct .

A. Group 16 elements chalcogens :: group 17 elements halogens

B.  $XeO_3$ : Pyramidal ::  $SeO_2$ : Linear

C. Dioxygen : Metallurgical operations : : Dinitrogen : refrigeration



D. Ozone : bleaching agent :: Nitric acid : Oxidising agent

**Answer: A**



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**3. Complete the following analogy:**

A: Substituting halogen B: Substitution alkane by alkoxy of haloalkane by amino group

A. A: Finkelstein Reaction, B: Hundsdiecker reaction.

B. A: Darzen's method:B: Groove's method

C. A: Williamsons synthesis, B Hofmann ammonolysis

D. A: Wurtz reaction, B: Frankland Reaction

**Answer: C**

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4. In an ionic crystalline solids, anions participate in the closed packed arrangement and voids are occupied by cations. For the stability of ionic crystal it is necessary that the electrostatic force of attraction in the oppositely charged ions is the maximum. The ratio and the possible coordination number of

cations are related to each other . when the radius ratio is below 0.225 , the cations occupies a trigonal void and between 0.732 to 1 the cation occupies cubic void .

In the given table relation in radius ratio and structural arrangement is given :

$r_+/r_-$	Structural arrangement	Examples
0.155-0.225	Triangular planar	$B_2O_3$
0.225-0.414	Tetrahedral	$HgS$
0.414-0.732	Octahedral	$MgO$
0.732-1	Cubic	$NH_4Br$

If NaCl is doped with  $10^4$  mole present of  $SrCl_2$ . The concentration of cation vacancies will be:

A.  $6.022 \times 10^{16} \text{ mol}^{-1}$

B.  $6.022 \times 10^{17} \text{ mol}^{-1}$

C.  $6.022 \times 10^{14} \text{ mol}^{-1}$

D.  $6.022 \times 10^{15} \text{ m}$

**Answer: B**



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5. In an ionic crystalline solids, anions participate in the closed packed arrangement and voids are occupied by cations. For the stability of ionic crystal it is necessary that the electrostatic force of attraction in the oppositely charged ions is the maximum. The ratio and the possible coordination number of

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0.414-0.732	Octahedral	MgO
0.732-1	Cubic	$NH_4Br$

The coordination number of cation in MgO in which the radii of cation is 65 pm and anion 140 pm. respectively.

A. 3

B. 4

C. 5

D. 6

**Answer: D**



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6. In an ionic crystalline solids, anions participate in the closed packed arrangement and voids are occupied by cations. For the stability of ionic crystal it is necessary that the electrostatic force of attraction

in the oppositely charged ions is the maximum. The ratio and the possible coordination number of cations are related to each other. When the radius ratio is below 0.225, the cation occupies a trigonal void and between 0.225 to 0.414 the cation occupies tetrahedral void and between 0.414 to 0.732 the cation occupies octahedral void and between 0.732 to 1 the cation occupies cubic void.

In the given table relation in radius ratio and structural arrangement is given :

$r_+/r_-$	Structural arrangement	Examples
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0.225-0.414	Tetrahedral	$HgS$
0.414-0.732	Octahedral	$MgO$
0.732-1	Cubic	$NH_4Br$

In tetrahedral voids, the actual shape of the void is:

A. tetra hedral

B. triangular

C. Spherical

D. Both (a) and (c)

**Answer: B**



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