CHEMISTRY

BOOKS - EDUCART PUBLICATION

SAMPLE PAPER 04

Section A

1. Which of the following oxides of nitrogen is the anhydride of nitrous acid?

A. N_2O

B. N_2O_3

C. N_2O_4

D. NO

Answer: B

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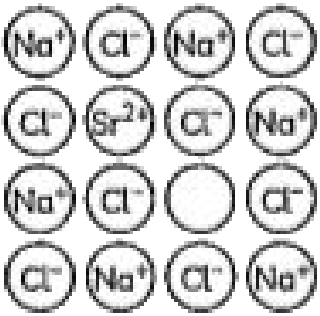
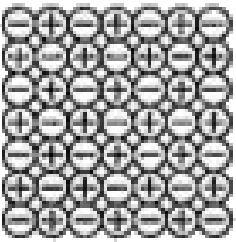
2. Which defect in solids are illustrated in the figure A and B below?



(A)



(B)

	(A)	(B)
(a)	Impurity	F-centre
(b)	Schottky defect	impurity defect
(c)	F-centre	impurity defect
(d)	Schottky defect	Frenkel defect

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3. The measured freezing point depression of a non-volatile solute in aqueous solution is $0.20^{\circ}C$. The elevation in boiling point of the same solution will be [K_f = 1.86 K/m, K_b = 0.52 K/m]

A. 0.0186

B. 0.056

C. 0.052

D. 5.2

Answer: B

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4. Diamond, silica and silicon carbide are:

A. Ionic solid

B. Covalent solid

C. Metallic solid

D. Molecular solid

Answer: B

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5. Identify compounds P, Q and R in the following reaction?

$$CH_3CH_3Br \xrightarrow{\text{alc. KOH}} P \xrightarrow{+HBr} Q \xrightarrow{+AgNO_2} R$$

A. $CH_2 = CH_2, CH_3CH_2Br. CH_3CH_2ON = O$

B. $CH_3CH_2OH, CH_3CH_2Br. CH_3CH_2ON = O$

C. $CH_2 = CH_2, CH_3CH_2Br, CH_3CH_2NO_2$

D. $CH_3CH_2OH, CH_3CH_2Br, CH_3CH_2NO_2$

Answer: C

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6. In nucleic acid the sequence is?

A. Phosphate, Base, Sugar

B. Sugar, Base, Phosphate

C. Base, Sugar, Phosphate

D. Base, Phosphate, Sugar

Answer: C

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7. An ether with molecular formula $C_5H_{12}O$ when heated with excess HI produced two alkyl iodide which on alkaline hydrolysis forms. compound (B) and (C), Oxidation of (8) give acid and oxidation of (C) give ketone. The compound A will be:

A. $C_2H_5OCH(CH_3)_2$

B. $C_2H_5OCH_2CH_2CH_3$

C. $CH_2OCH_2CH_2CH_2CH_3$

D. $CH_3OCH_2CH_2CHCH_3$

Answer: A

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8. Identify A and B in following reaction:

$6Cl_2 + 6Ba(OH)_2 \rightarrow A + B + 6H_2O$:

A. $Ba(ClO_3)_2$, $BaCl_2$

B. $BaCl_2$, HCl

C. BaO, $BaCl_2$

D. BaO, HCl

Answer: A

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9. The most acidic halo substituted phenol among the given compounds is:

A. o-fluorophenol

B. o-chlorophenol

C. o-iodophenol

D. o-bromophenol

Answer: B

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10. Which is not a molecular solid?

A. copper

B. benzene

C. ice

D. quartz

Answer: A,D

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11. For the preparation of n-propylbenzene which of the following reactions is most suitable?

A. Wurtz-fittig reaction

B. Wurtz reaction

C. Friedel-Crafts alkylation

D. Grignard reaction

Answer: A

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12. Which of the following has no units?

A. Molarity

B. Molality

C. Normality

D. Mole fraction

Answer: D

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13. What is the correct order strength of chlorophenols:

A. phenol $<$ p-chlorophenol $<$ m-chlorophenol $<$ o-chlorophenol

B. phenol $<$ m-chlorophenol $<$ p-chlorophenol $<$ o-chlorophenol

C. o-chlorophenol $>$ m-chlorophenol $>$ p-chlorophenol $>$ phenol

D. p-chlorophenol $<$ m-chlorophenol $<$ o-chlorophenol $<$ phenol

Answer: C

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14. The geometry of H_2S and its dipole moment are:

A. Angular and non-zero

B. Angular and zero

C. Linear and zero

D. Linear and non-zero

Answer: A

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15. A biological catalyst is:

A. a carbohydrate

B. a peptide

C. an amino acid

D. an enzyme

Answer: D

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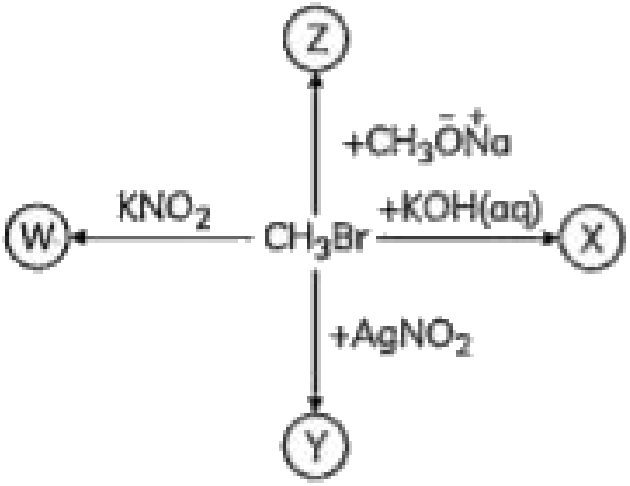
16. What will be x, w, y and z in the given set of reactions?



A.

$x = CH_3OH, y = CH_3ONO, w = CH_3NO_2, z = CH - O - CH_3$

B.

$x = CH_4, y = CH_3ONO, w = CH_3NO_2, z = CH_3 - O - CH_3$

C. $x = CH_3OH, y = CH_3NO_2, w = CH_3ONO, z = CH_3 - CH_3$

D.

$x = CH_3OH, y = CH_3NO_2, w = CH_3ONO, z = CH - O - CH_3$

Answer: A

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17. What will be the correct order of the reactivity of the compounds (I) MeBr (II) $PhCH_2Br$ (III) $MeCl$ towards nucleophilic substitution reactions?

A. $(I) > (II) > (III)$

B. $(III) > (I) > (II)$

C. $(II) > (I) > (III)$

D. $(I) > (III) > (IV)$

Answer: C

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18. The structure of $XeOF_2$ is:

A. distorted octahedral

B. T-shaped

C. pyramidal

D. tetrahedral

Answer: B

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19. The value of Henry's constant K_H.

A. increase with increase in temperature

B. decrease with increase in temperature

C. remains constant

D. first increase then decrease

Answer: A

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20. The noble gas mixture is cooled in a coconut bulb at 173K. The gases that are not adsorbs are

A. He and Ne

B. Ar and Kr

C. He and Xe

D. Ne and Xe

Answer: A

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21. Coagulation of milk is:

A. hydrolysis of lactose

B. denaturation of proteins

C. breaking of peptide bonds

D. breaking of proteins into amino acid

Answer: B

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22. Which of the following reaction is not feasible?

A. $2KI + Br_2 \rightarrow 2KBr + I_2$

B. $2KBr + I_2 \rightarrow 2KI + Br_2$

C. $2KBr + Cl_2 \rightarrow 2KCl + Br_2$

D. $H_2O + 2F_2 \rightarrow 4HF + O_2$

Answer: B

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23. Phenol reacts with bromine in carbon disulphide at low temperature to give

A. m-bromophenol

B. 2, 4, 6-tribromopheonl

C. o and p-bromophenol

D. p-bromophenol

Answer: C

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24. Which of the following are peroxo acids of sulphur?

A. $H_2S_2O_6$ and $H_2S_2O_7$

B. $H_2S_2O_7$ and $H_2S_2O_8$

C. H_2SO_5 and $H_2S_2O_7$

D. H_2SO_5 and $H_2S_2O_8$

Answer: D

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25. Which of the following is correct order of solubility in water ?

A. $KCl < CH_3OH < CH_3C \equiv N < C_6H_{12}$

B. $KCl < CH_3C \equiv NC < CH_3OH < C_6H_{12}$

C. $KCl < C_6H_{12} < CH_3C \equiv N < CH_3OH$

D. $KCl < CH_3OH < C_6H_{12} < CH_3C \equiv N$

Answer: A

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Section B

1. 18 g of sucrose is dissolved in 162 g of water Calcualte the mass percentage of solution :

A. $10\ \%$

B. $20\ \%$

C. $15\ \%$

D. $18\ \%$

Answer: A

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2. $CH_3Br \xrightarrow[\text{Dry ether}]{Mg} CH_2MgBr \xrightarrow{D_2O} B$

A. CH_3MgBr and CH_3OH

B. CH_3MgBr and CH_3D

C. CH_3MgBr and CH_3OH

D. CH_3MgBr and CH_4

Answer: B

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3. What is the structure of BrF_5 :

A. Pentagonal bipyramidal

B. Octahedral

C. Square pyramidal

D. Bent T-shape

Answer: C

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4. Which is not a reducing sugar?

A. glucose

B. fructose

C. mannose

D. sucrose

Answer: D

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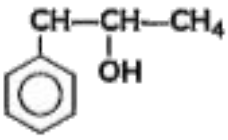
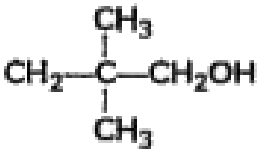
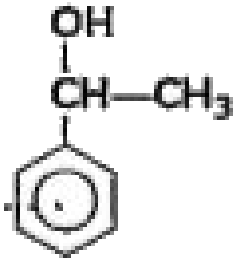
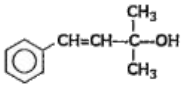
5. Which among the flowing compound(s) is/ are primary alcohol?

A. 

B. 

C. 

D. 

Answer: B

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6. In which compound oxygen does not show - 2 oxidation state:

A. H_2O

B. CO_2

C. F_2O

D. OCl_2

Answer: C

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7. Structure of a mixed oxide is cubic closed - packed (ccp) .The cubic unit cell of mixed oxide is composed of oxide ions .One fourth of the tetrahedral voids are occupied by divalent metal A and the octahedral voids are occupied by a monovelent metal B .The formula of the oxide is

A. A_2BO_2

B. ABO_2

C. $A_2B_3O_4$

D. AB_2O_2

Answer: D

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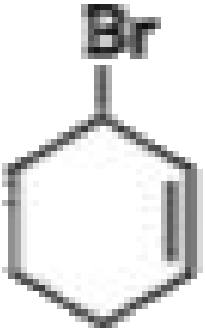
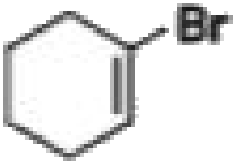
8. Among the given compounds which of the following is vinylic halides:

A. $CH_3CH = CHCH_2Br$

B. 

C. 

D. $CH_3\underset{\underset{CH_3}{|}}{C}HCH - CH_2$

Answer: C

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9. Which of the following pairs of ions are isoelectronic and isostructural ?

A. SO_3^{2-}, NO_3^-

B. ClO_3^- , SO_3^{2-}

C. ClO_3^- , CO_3^{2-}

D. CO_3^{2-} , NO_3^-

Answer: D

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10. Which of the following will have lowest vapour pressure?

A. water

B. methyl alcohol

C. ether

D. mercury

Answer: D

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11. Which of the following reaction is not the evidence for presence aldehyde:

A. Reaction of glucose with hyroxylamine

B. Reaction of glucose with Br_2 water

C. Reaction of glucose with HCN

D. Reaction of glucose with acetyle chloride

Answer: D

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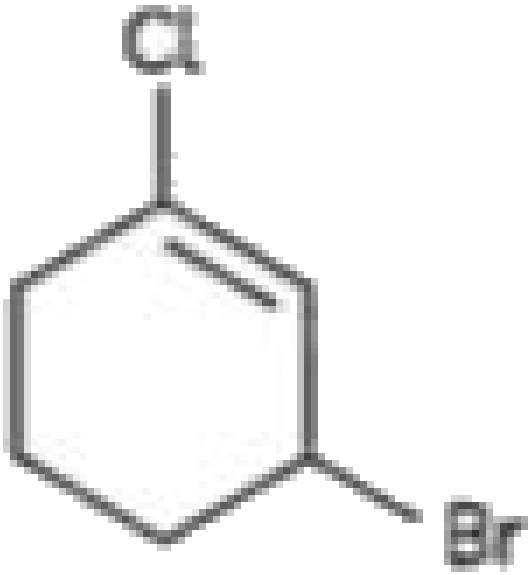
12. What is the IUPAC name of the compound:



A. 6-bromo-2-chlorocyclohexane

B. 2-bromo-6-chlorocyclohex-1-ene

C. 3-bromo-1-chlorocyclohexene

D. 1-bromo-3-chlorocyclohexene

Answer: C

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13. The value of a, b and c values in orthorhombic crystal are 4.2 Å, 8.6 Å and 8.3 Å. The molecular mass of the solute is $155 \mathrm{g\ mol}^{-1}$ and density is 3.3 g/cc. The number of formula units per unit cell is:

A. 6

B. 3

C. 4

D. 2

Answer: C

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14. The property of halogens which is not correctly matched is

A. $F > Cl > Br > I$ (Electron affinity)

B. $I > Br > Cl > F$ (Density)

C. $F > Cl > Br > I$ (Electronegativity)

D. $F > Cl > Br > I$ (Ionisation energy)

Answer: a

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15. Which of the following reactions would give the best yield of $t-$ butyl methyl ether?

A. Tert butyl alcohol and conc H_2SO_4

B. Tert. butyl chloride and CH_3ON_3

C. Sodiurm tert , butoxide and CH_3I

D. Butoxide , HCl tert butyl

Answer: A

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16. What will the major product of the following :

$$C_2H_5ONa + CH_3 - \overset{CH_3}{\underset{CH_3}{\overset{|}{\underset{|}{C}}}} - Cl \rightarrow ?$$

A. $CH_3\overset{CH_3}{\underset{C_2H_5}{\overset{|}{\underset{|}{C}}}} - OCH_3$

B. $CH_3 - \underset{CH_3}{\overset{|}{\underset{|}{C}}} = CH_3$

C. $CH_2 = CH_2$

D. $CH_3 - \overset{CH_3}{\underset{CH_3}{\overset{|}{\underset{|}{C}}}} - OC_2H_5$

Answer: B

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17. Which of the following statement is correct about dinitrogen?

A. N_2 is a diatomic molecule

B. Hydrogen bonding is absent in NH_3

C. Nitrogen shows covalency of 3

D. Nitrogen is chemically inert

Answer: B

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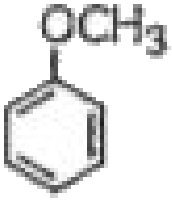
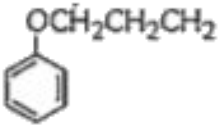
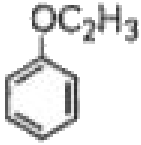
18. Identify X in the following reaction:

A.





B.



C.

D. $CH_3 - CH = CH_3$

Answer: B

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19. Calculate the number of isomeric halopropanes produced, when propane gets chlorinated is:

A. 1

B. 2

C. 3

D. 4

Answer: B

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20. Assertion (A): Nitrogen has diamagnetic in nature.

Reason (R): Nitrogen has chemically active element.

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: C

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21. Assertion: It is difficult to replace chlorine by $-OH$ in chlorobenzene in comparison to that in chloroethane

Reason: Chlorine-carbon (C-Cl) bond in chlorobenzene has a partial double bond character due to resonance.

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22. Assertion (R): At low concentration equimolar solutions of non electrolytes are isotonic and have equal osmotic pressure.

Reason (R): Osmotic pressure is directly proportional to temperature of solution.

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23. Assertion: SiF_6^{2-} is known but $SiCl_6^{2-}$ is not.

Reason: Size of fluorine is small and its lone pair of electrons intersects with d-orbitals of Si strongly.

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24. Assertion : Acetone and aniline shows negative deviations.

Reason : H-bonding between acetone and aniline is stronger than that between acetone-acetone and aniline-aniline.

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Section C

1. Match the following

	Column I		Column II
(I)	Keto hexose	(A)	Cellulose
(II)	Animal starch	(B)	Nucleotides
(III)	Phosphate group	(C)	Fructose
(IV)	Glycosidic linkage	(D)	Glycogen
(V)	Plant starch		

which of the following is the best matched option :

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

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

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

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

Answer: A

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2. Which of the followihng analogies is correct

A. NH_3 : basic : : PH_3 : acidic

B. $BiCl_3$: Not exist : : PCl_5 : Exist

C. H_2O liquid : : H_2S : gas

D. NF_3 – Pyramidal : : FCl_3 : Linear

Answer: C

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3. Complete the following analogy: (A) Replacement of halogen by hydroxyl group in arenes

(B) Reaction of benzene with HCl over heated cupric powder

A. Dow's process :: Rasching process

B. Sandamayer's reaction :: Ulmann reaction

C. Wurtz reaction:: Ulmann reaction

D. Darzen's process :: Groove's process

Answer: A

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4. Read the passage given below and answer the question. A metal excess defect is one of the defects seen in the crystal structures. The other defect is metal deficiency defect. These are the nonstoichiometric inorganic solids that contain constituent elements in non-stoichiometric ration because of the defects in their crystal structures.

This defect is caused due to anionic vacancies and by the presence of extra cations in the interstitial sites. When alkali metal halides are heated in an atmosphere of vapour of the alkali metal, anion vacancies are created. This anion is then diffuse to the surface of the crystal and combine with newly generated metal cations.

In the given table the cation and amion radius ratio is given, which are helpful in predict the co-ordination number and geometry.

$\frac{r^+}{r^-}$	Structural arrangement
0-0.155	Linear
0.155-0.225	Trigonal planar
0.225-0.414	Tetrahedral
0.414-0.732	Octahedral
0.732-1	Cubic
1.0	Cubooctahedral

. When sodium chloride is heated in the atmosphere of sodium vapours ,the crystal becomes yellow in color due to presence of

A. vapour of Na

B. chloride anion

C. electron present at anionic site

D. Molten Nacl

Answer: C

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5. Read the passage given below and answer the question. A metal excess defect is one of the defects seen in the crystal structures. The other defect is metal deficiency defect. These are the nonstoichiometric inorganic solids that contain constituent elements in non-stoichiometric ration because of the defects in their crystal structures. This defect is caused due to anionic vacancies and by the presence of extra cations in the interstitial sites. When alkali metal halides are heated in an atmosphere of vapour of the alkali metal, anion vacancies are created. This anion is then diffuse to the surface of the crystal and combine with newly generated metal cations.

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.

The copper metal crystallies in fcc with a unit cell length of 361 pm. The radius of copper atom is :

A. 108 pm

B. 128 pm

C. 157 pm

D. 181 pm

Answer: B

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6. Read the passage given below and answer the question. A metal excess defect is one of the defects seen in the crystal structures. The other defect is metal deficiency defect. These are the nonstoichiometric inorganic solids that contain constituent elements in non-stoichiometric ration because of the defects in their crystal structures. This defect is caused due to anionic vacancies and by the presence of extra cations in the interstitial sites. When alkali metal halides are heated in an atmosphere of vapour of the alkali metal, anion vacancies are created. This anion is then diffuse to the surface of the crystal and combine with newly generated metal cations.

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1.0	Cubooctahedral

.

The coordination number of cation occupying an octahedral void is :

A. 4

B. 6

C. 8

D. 12

Answer: B

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