



BYJU'S Part Test for Board Term I (CBSE Grade 12)

Date: 18/11/2021

Subject: Chemistry

Class: Standard XII

Time: 90 minutes

Maximum Marks: 35

General Instructions:

1. The Question Paper contains three sections.
2. Section A has 25 questions. Attempt any 20 questions.
3. Section B has 24 questions. Attempt any 20 questions.
4. Section C has 6 questions. Attempt any 5 questions.
5. All questions carry equal marks.
6. There is no negative marking.

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Topic : Section A

Class: Standard XII

1. A crystal (of an element 'X') has a bcc structure. It has an edge length of $4.3 \text{ \AA}$. The shortest distance between the atoms is:
 - A. $1.86 \text{ \AA}$
 - B. $4.3 \text{ \AA}$
 - C. $3.72 \text{ \AA}$
 - D. $7.44 \text{ \AA}$

2. When heated above 916°C , iron changes its bcc crystalline form to fcc without the change in the radius of atom. The ratio of density of the crystal before and after heating is:
Given:
[At. wt. of $\text{Fe} = 56 \text{ g mol}^{-1}$]
 - A. 1.57
 - B. 0.91
 - C. 0.25
 - D. 1.73

3. What will be the coordination number of cubic close packing (ccp) lattice?
 - A. 12
 - B. 8
 - C. 6
 - D. 4

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4. Which of the following is true regarding amorphous solids?
 - A. posses sharp melting points
 - B. undergo clean cleavage when cut with knife
 - C. do not undergo clean cleavage when cut with a knife
 - D. posses orderly arrangement over long distances

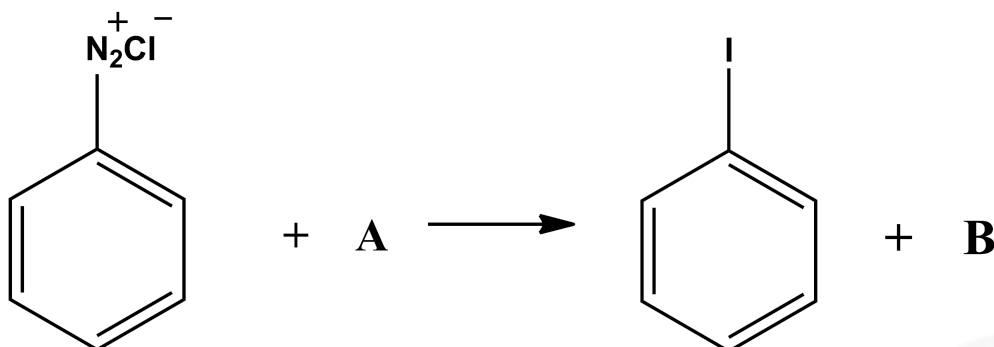
5. The coordination number of Zn^{2+} and S^{2-} ions in the zinc blende (ZnS) type structure is
 - A. 4 : 4
 - B. 6 : 6
 - C. 8 : 8
 - D. 4 : 8

6. The nucleophilicity order of halogens in polar protic solvent is :
 - A. $F^- > Cl^- > Br^- > I^-$
 - B. $F^- > I^- > Br^- > Cl^-$
 - C. $F^- < Cl^- < Br^- < I^-$
 - D. $Cl^- > F^- > Br^- > I^-$

7. Gem-dibromide is
 - A. $CH_3CBr_2CH_3$
 - B. CH_2BrCH_2Br
 - C. $CH_2(Br)CH_2CH_3$
 - D. None of these

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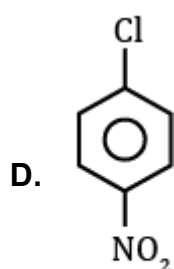
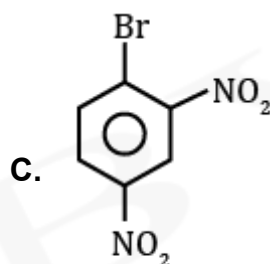
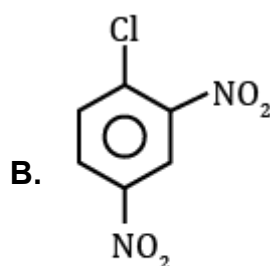
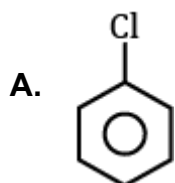
8. What is 'A' and 'B' respectively in the following reaction?



- A.** $A = \text{Cu}_2\text{Cl}_2$, $B = \text{N}_2$
- B.** $A = \text{Cu}_2\text{I}_2$, $B = \text{I}_2$
- C.** $A = \text{I}_2$, $B = \text{N}_2$
- D.** $A = \text{KI}$, $B = \text{N}_2$

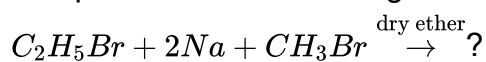
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9. Which of the following compound gives fastest aromatic nucleophilic substitution reaction ?

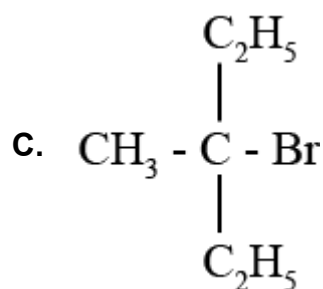
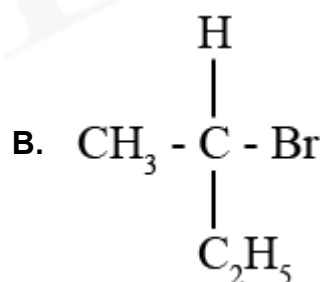
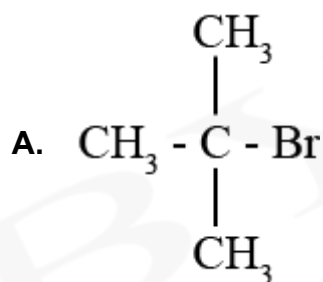


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10. The product of the following reactions is (are):

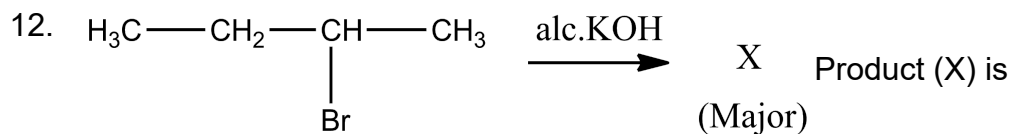


- A. ethane
 - B. propane
 - C. butane
 - D. ethane, propane and butane
11. Which one of the following compounds will give racemic mixture in S_N1 reaction?



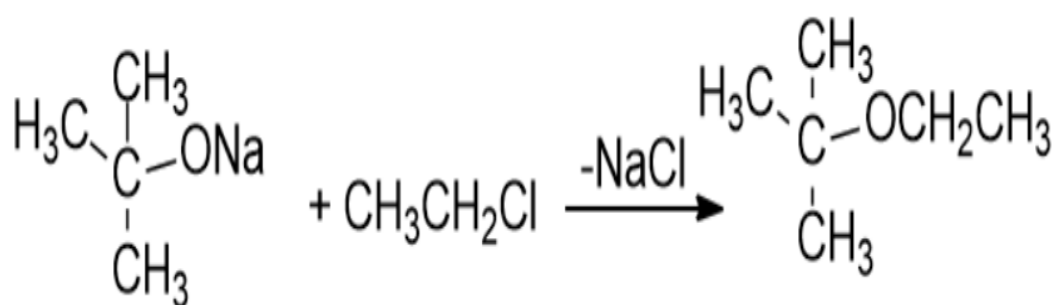
- D. None of the above

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- A. 1-butene
- B. Butan-2-ol
- C. Cis-2-butene
- D. Trans-2-butene

13. The reaction,

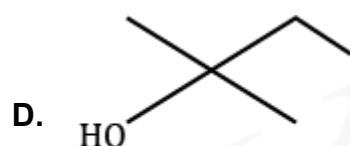
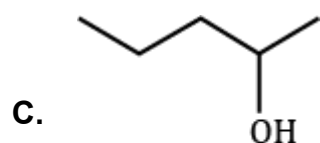
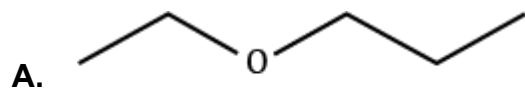


is called:

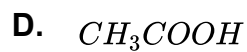
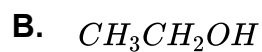
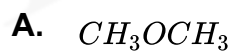
- A. Etard reaction
 - B. Gattermann-koch reaction
 - C. Williamson synthesis
 - D. Esterification reaction
14. Electrophilic substitution reaction in phenol takes place at:
- A. para position
 - B. meta position
 - C. ortho position
 - D. ortho and para position

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15. Which of the following exhibit highest boiling point?



16. The compound in which intermolecular hydrogen bonding is not possible is :



17. The nature of 2, 4, 6-trinitrophenol is :

A. neutral

B. basic

C. acidic

D. weak basic

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18. Which one of the following reagents can not be used to oxidise primary alcohols to aldehydes?
- A. CrO_3 in anhydrous medium
 - B. $KMnO_4$ in acidic medium
 - C. Pyridium chlorochromate
 - D. Heat in presence of Cu at $573K$
19. Which of the following aldehydes can produce 1° alcohols when treated with Grignard reagent?
- A. Methanal
 - B. Ethanal
 - C. Propanal
 - D. Butanal
20. Sucrose on hydrolysis gives:
- A. $\beta - D - \text{glucose} + \alpha - D - \text{fructose}$
 - B. $\alpha - D - \text{glucose} + \beta - D - \text{glucose}$
 - C. $\alpha - D - \text{glucose} + \beta - D - \text{fructose}$
 - D. $\beta - D - \text{fructose} + \alpha - D - \text{fructose}$

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21. A unit formed by the attachment of a nitrogenous base to 1' position of sugar is known as
- A. Nucleotide
 - B. Nucleoside
 - C. Nucleic acid
 - D. Peptide
22. Which of the following statement is not true about RNA?
- A. It controls the synthesis of protein
 - B. It has always double stranded α - helix structure
 - C. It can replicate
 - D. It is present in the nucleus of the cell
23. Two forms of D-glucopyranose, are called
- A. Enantiomers
 - B. Anomers
 - C. Epimers
 - D. Diastereomers
24. The secondary structure of a protein refers to:
- A. Regular folding patterns of continuous portions of the polypeptide chain
 - B. Three-dimensional structure, specially the bond between amino acid residues that are distant from each other in the polypeptide chain
 - C. Mainly denatured proteins and structures of prosthetic groups
 - D. Linear sequence of amino acid residues in the polypeptide chain

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25. Total number of voids in 0.5 mol of a compound forming hexagonal closed packed structure are

A. 6.022×10^{23}

B. 3.011×10^{23}

C. 9.033×10^{23}

D. 4.516×10^{23}

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Date: 18/11/2021

Subject: Chemistry

Topic : Section B

Class: Standard XII

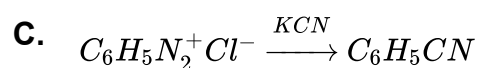
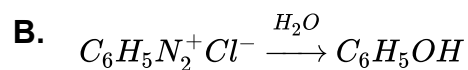
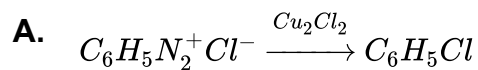
1. Three elements A,B and C crystalize in a cubic lattice with A atoms at the corners, B atoms at the cube center and C atoms at the centre of the face of the cube.

When all the atoms from two different body diagonals are removed, then find the ratio of effective number of particles (Z_{eff}) initially (before removal of atoms) to the effective number of particles finally (after removal of atoms).

- A. 5 : 3
 - B. 3 : 5
 - C. 7 : 10
 - D. 10 : 7
2. Which of the following is correct relation between radius of octahedral void (r) and radius of atom (R) in closed packed structure?
- A. $R = 0.732r$
 - B. $r = 0.732R$
 - C. $R = 0.414r$
 - D. $r = 0.414R$
3. The radius of a divalent cation A^{2+} is 94 pm and that of a divalent anion B^{2-} is 146 pm . The compound AB has:
- A. Rock salt structure
 - B. Zinc blende structure
 - C. Antifluorite structure
 - D. Caesium chloride like structure

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4. Which of the following is an example of Sandmeyer's reaction?



D. None of the above

5. Same halogen atom (-X), increased in the size of the alkyl chain
 CH_3Cl , CH_3CH_2Cl , $CH_3(CH_2)_2Cl$, $CH_3(CH_2)_3Cl$

What is the effect on the boiling point and the density?

A. Boiling point increases, density increases

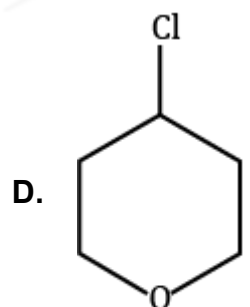
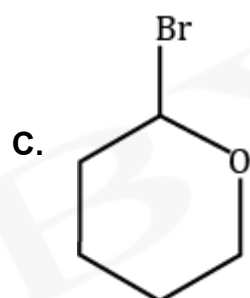
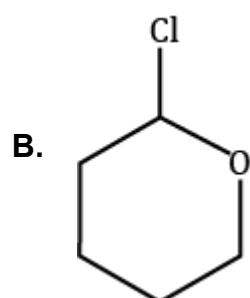
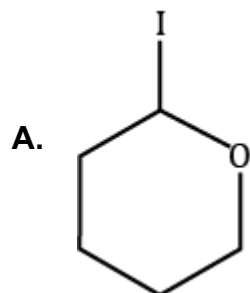
B. Boiling point increases, density decreases

C. Boiling point decreases, density decreases

D. Boiling point decreases, density increases

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6. Which of the following compound will be most reactive for S_N1 reactions?



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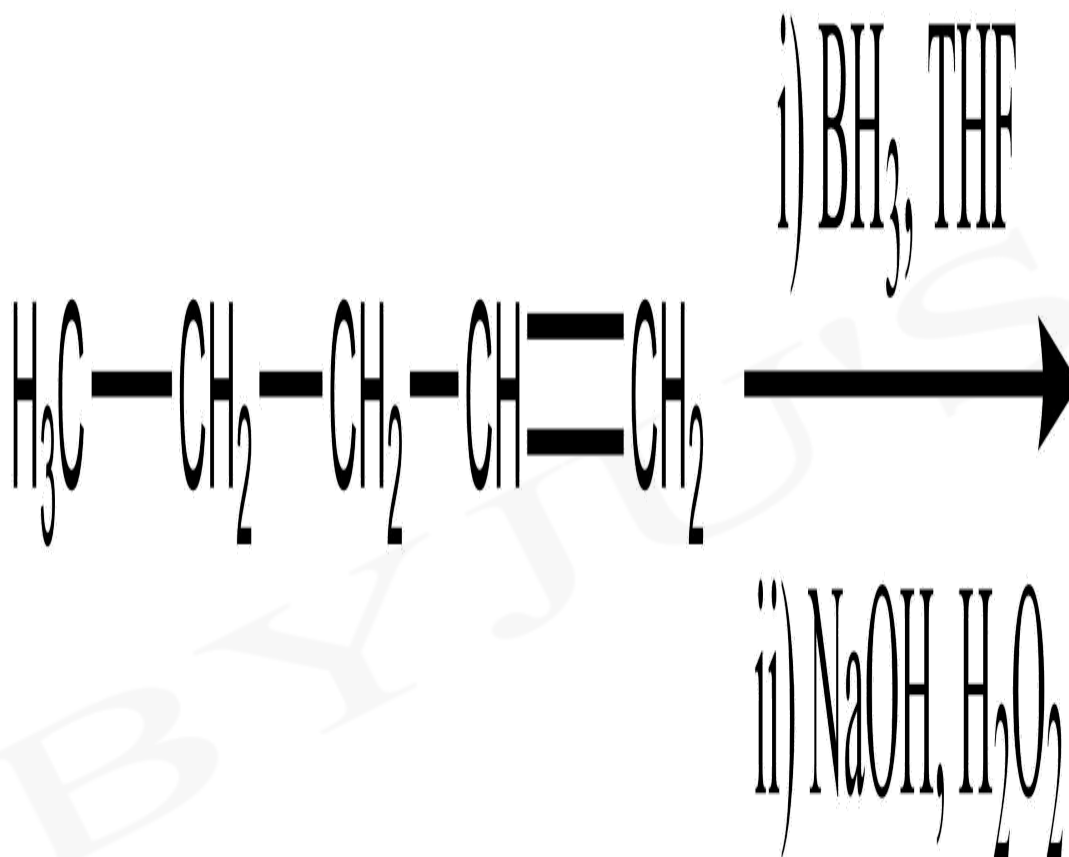
7. Which one of the following solvents favors S_N2 reaction?
1. DMSO
 2. Ethanol
 3. Acetone
 4. water
- A.** 1 & 3
- B.** 1 & 2
- C.** 1 & 4
- D.** All four
8. The order of reactivities of the following alkyl halides for a S_N2 reaction is
- A.** $RI > RBr > RCl > RF$
- B.** $RF > RBr > RCl > RI$
- C.** $RF > RCl > RBr > RI$
- D.** $RCl > RBr > RF > RI$
9. Among the following, which reaction of alcohol does not show cleavage of $R - O$ linkage:
- A.** $ROH + PCl_5$
- B.** $ROH + SOCl_2$
- C.** $ROH + HCl$
- D.** $ROH + Na$

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10. The compound which reacts fastest with Lucas reagent at room temperature is:
- A. Butan-1-ol
 - B. Butan-2-ol
 - C. 2-methylpropan-1-ol
 - D. 2-methylpropan-2-ol
11. When phenol is treated with $CHCl_3$ and $NaOH$, the product formed is:
- A. Benzaldehyde
 - B. Salicylaldehyde
 - C. Salicylic acid
 - D. Benzoic acid
12. Identify the nucleophile that attacks the carbocation in the second step of acid catalysed hydration of alkenes.
- A. OH^-
 - B. H_2O
 - C. H^+
 - D. H_3O^+

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13. The product of following reaction is:



- A. Pentan-1-ol
 - B. Pentan-2-ol
 - C. Pentane
 - D. 1,2-Pentanediol
14. Name the reagent used for Bromination of phenol to 2,4,6-tribromophenol :
- A. Br_2 in $\text{CS}_2/\text{CHCl}_3$
 - B. NBS
 - C. Br_2 in H_2O_2

D. Br_2 in H_2O

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15. The product of the reaction of hot hydrogen iodide with 1-propoxypropane is
- A. Propan-1-ol
 - B. 1-Iodopropane
 - C. Both (a) and (b)
 - D. None of the above
16. Which of the following statement is incorrect about the fibrous protein?
- A. The polypeptide chains are parallel to each other
 - B. The polypeptides chains are held together by hydrogen bonds only
 - C. Fibrous proteins are generally insoluble in water
 - D. Some common examples of fibrous protein are keratin and myosin
17. Which of the statements about "Denaturation" given below are correct?
- (1) Denaturation of proteins causes loss of secondary and tertiary structures of the protein
 - (2) The coagulation of egg white on boiling is a common example of denaturation.
 - (3) Denaturation affects primary structure which gets distorted
- A. (2) and (3)
 - B. (1) and (3)
 - C. (1) and (2)
 - D. (1), (2) and (3)

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18. Which of the following is an acidic amino acid ?

- A. Glycine
- B. Valine
- C. Leucine
- D. Glutamic acid

19. Glucose is oxidised by nitric acid and produce

- A. sorbitol
- B. saccharic acid
- C. glucocyanohydrin
- D. gluconic acid

20. Given below are two statements labelled as Assertion (A) and Reason (R).

Assertion (A): Glucose and fructose are reducing sugars.

Reason (R): Glucose and fructose contain a free aldehydic and ketonic group adjacent to a $\begin{array}{c} | \\ HCOH \end{array}$ group.

- 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

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21. Given below are two statements labelled as Assertion (A) and Reason (R).

Assertion (A): All naturally occurring α - amino acids except glycine are optically active.

Reason (R): Most naturally occurring amino acids have L-configuration.

- 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
22. Given below are two statements labelled as Assertion (A) and Reason (R).

Assertion (A): There are two atoms per unit cell in bcc.

Reason (R): A body-centred cubic (bcc) unit cell has an atom at each of corners and also one atom at its body centre.

- 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
23. Given below are two statements labelled as Assertion (A) and Reason (R).

Assertion (A): In monohaloarenes, further electrophilic substitution occurs at ortho and para positions.

Reason (R): Halogen atom is a ring deactivator.

- 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

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24. Given below are two statements labelled as Assertion (A) and Reason (R).

Assertion (A): o-nitrophenol is less soluble in water than the m- and p-isomers.

Reason (R): m- and p-nitrophenols exist as associated molecules.

- 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

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Subject: Chemistry

Topic : Section C

Class: Standard XII

1.

I	II
(i) Amino acids	(A) Protein
(ii) Thymine	(B) Nucleic acid
(iii) Insulin	(C) DNA
(iv) Phosphodiester linkage	(D) Zwitter ion
(v) Uracil	

Which of the following is the best matched option?

- A.** i- AD ii - B, iii - C, iv - B, v - A
- B.** i- AD, ii- C, iii - A, iv - BC, v - B
- C.** i- A, ii - CD, iii - A, iv - B, v - C
- D.** i- D, ii- BC, iii - B, iv - B, v - A

2. Which of the following analogies is correct for RNA base pairs?

Adenine(A):_____::Guanine(G):Cytosine(C)

- A.** Urin
- B.** Uracil
- C.** Thymin
- D.** Purine

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3. Which of the following analogies is correct?

Choloform : Trichloromethane :: Ethylene dichloride :

- A. Dichloromethane
 - B. 1,2-Dichloroethene
 - C. 1,1-Dichloroethane
 - D. 1,2-Dichloroethane
4. The adjective, 'crystalline' when applied to solids, implies an ideal crystal in which the structural units, termed as unit cells, are repeated regularly and indefinitely in three demansions in space. The unit cell containing at least one molecule, has a definite orientation and shape defined by the translational vectors, a , b and c . The unit cell therefore has a definite volume, V that contains the atoms and molecules necessary for generating the crystal.

Every crystal can be classified as a member of one of the seven possible crystal systems or crystal classes that are defined by relationships, a , b and c of the unit cell and between the individual angles. α , β and γ of the unit cell. The structure of the given crystal may be assigned to one of the 230 space groups. These uniquely define the possible ways of arranging atoms in a three-dimentional solid.

Based on these observations, seven crystal systems were identified: tricilinic, monoclinic, trogonal or rhombohedral, tetragonal, hexagonal, rhombic or orthorhombic and cubic.

Identify the type of crystal system of the following:

(A) KNO_3 ; (B) CaCO_3 ; (C) TiO_2 ; (D) $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$;

- A. A– Cubic; B–Triclinic; C–Hexagonal; D–Rhombohedral
- B. A–Tetragonal ; B–Monoclinic; C–Triclinic; D–Hexagonal
- C. A–Orthorhombic ; B–Rhombohedral; C–Tetragonal; D–Triclinic
- D. A–Rhombohedral ; B–Hexagonal ; C–Trigonal; D–Orthorhombic

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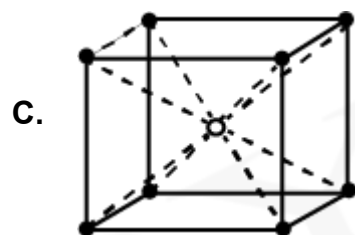
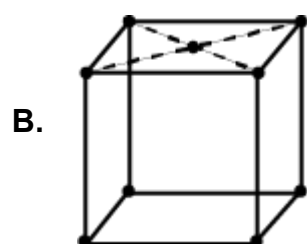
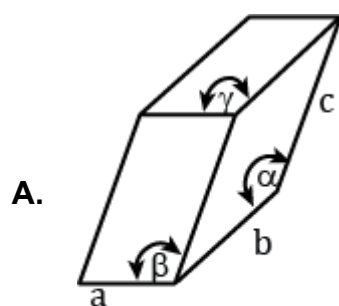
5. The adjective, 'crystalline' when applied to solids, implies an ideal crystal in which the structural units, termed as unit cells, are repeated regularly and indefinitely in three dimensions in space. The unit cell containing at least one molecule, has a definite orientation and shape defined by the translational vectors, a , b and c . The unit cell therefore has a definite volume, V that contains the atoms and molecules necessary for generating the crystal.

Every crystal can be classified as a member of one of the seven possible crystal systems or crystal classes that are defined by relationships, a , b and c of the unit cell and between the individual angles. α , β and γ of the unit cell. The structure of the given crystal may be assigned to one of the 230 space groups. These uniquely define the possible ways of arranging atoms in a three-dimensional solid.

Based on these observations, seven crystal systems were identified: triclinic, monoclinic, trigonal or rhombohedral, tetragonal, hexagonal, rhombic or orthorhombic and cubic.

In which of the following structure unit cell shows the triclinic structure?

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6. The adjective, 'crystalline' when applied to solids, implies an ideal crystal in which the structural units, termed as unit cells, are repeated regularly and indefinitely in three dimensions in space. The unit cell containing at least one molecule, has a definite orientation and shape defined by the translational vectors, a , b and c . The unit cell therefore has a definite volume, V that contains the atoms and molecules necessary for generating the crystal.

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Based on these observations, seven crystal systems were identified: triclinic, monoclinic, trigonal or rhombohedral, tetragonal, hexagonal, rhombic or orthorhombic and cubic.

The crystal structure is obtained by associating structural motifs with lattice points. Each repeated motif has

- A.** Same structure but different spatial arrangement
- B.** Same spatial arrangement but different structure
- C.** Different structure and different spatial arrangement
- D.** Same structure and same spatial arrangement