

## CHEMISTRY

# BOOKS - FULL MARKS CHEMISTRY (TAMIL ENGLISH)

# SOLID STATE

Evaluate Yourself I

**1.** An element has a face centered cubic unit cell with a length of 352.4 pm along an edge. The density of the element is 8.9 gcm-3. How many atoms are present in 100 g of an element ?

**2.** Determine the density of CsCI which crystallizes in a bcc

type structure with an edge length 412.1 pm.

**View Text Solution** 

3. A face centered cubic solid of an element (atomic mass 60)

has a cube edge of 4Å. Calculate its density.



**Textbook Evaluation I Choose The Best Answer** 

1. Graphite and diamond are .....

A. Covalent and molecular crystals

B. ionic and covalent crystals

C. both covalent crystals

D. both molecular crystals

Answer: C



**2.** An ionic compound  $A_x B_y$  crystallizes in fcc type crystal structure with B ions at the centre of each face and A ion occupying centre of the cubic, the correct formula  $A_x B_y$  is

. . . . . . . . . . . . . .

 $\mathsf{B.}\,AB_3$ 

 $\mathsf{C}.A_3B$ 

D.  $A_8B_6$ 

Answer: B



**3.** The ratio of close packed atoms to tetahedral hole in cubic

packing is .....

A. 1:1

B. 1:2

C.2:1

D. 1:4

#### Answer: B

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**4.** Solid  $CO_2$  is an example of .....

A. Covalent solid

B. metallic solid

C. molecular solid

D. ionic solid

Answer: C



**5.** Assertion : monoclinic sulphur is an example of monoclinic crystal system

Reason : for a monoclinic system,a
eq b
eq c and  $a=\gamma=90^\circ, eta
eq 90^\circ$ 

A. Both assertion and reason are true and reason is the correct explanation of assertion.

B. Both assertion and reason are true but reason is not

the correct explanation of assertion.

C. Assertion is true but reason is false.

D. Both assertion and reason are false

Answer: A



**6.** In calcium fluoride, having the flurite structure the coordination number of  $Ca^{2+}$  ion and  $F^{-}$  Ion are ...............

A. 4 and 2

B. 6 and 6

C. 8 and 4

D. 4 and 9

Answer: C

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A.  $6.023 imes 10^{23}$ 

B.  $6.023 imes 10^{22}$ 

 $\text{C.}~60.23\times10^{23}$ 

D. 
$$\left(rac{6.023 imes 10^{23}}{8 imes 40}
ight)$$

Answer: B

**View Text Solution** 

8. The number of carbon atoms per unit cell of diamond is

A. 8

.....

B. 6

C. 1

#### Answer: A

٢

9. In a solid atom M occupies ccp lattice and 
$$\left(\frac{1}{3}\right)$$
 of  
tetrahedral voids = 2n  
Given that  $\left(\frac{1}{3}\right)$ rd of tetrahedral voids are occupied i.e.,  
 $\left(\frac{1}{3}\right) \times 2n$  are occupied by6 N atoms  $\therefore M: N \Rightarrow n: \left(\frac{2}{3}\right)$   
 $1: \left(\frac{2}{3}\right) 3: 2 \Rightarrow M_3 N_2$ 

A. MN

 $\mathsf{B.}\,M_3N$ 

### $\mathsf{C}.\,MN_3$

D.  $M_3N_2$ 

#### Answer: D



10. The composition of a sample of wurtzite is  $Fe_{0.93}O_{1.00}$ what % of Iron present in the form of  $Fe^{3+}$ ?

A. 16.05~%

 $\textbf{B.}\,15.05~\%$ 

C. 18.05 %

D. 17.05 %

Answer: B



11. The ionic radii of  $A^+$  and  $B^-$  are  $0.98 imes 10^{-10}m$  and  $1.81 imes 10^{-10}m$ , the coordination number of each ion in AB is

A. 8

.....

B. 2

C. 6

D. 4

Answer: C



A. 400 pm

B. 800 pm

C. 
$$\sqrt{3}$$
 × 100 pm  
D.  $\left(\frac{\sqrt{3}}{2}\right)$  × 400 pm

Answer: D

View Text Solution

**13.** A solid compound XY has NaCl structure. If the radius of the cation is 100 pm, the radius of the anion will be.....

$$A. \left(\frac{100}{0.414}\right)$$
$$B. \left(\frac{0.732}{100}\right)$$

 $\text{C.}\,100\times0.414$ 

$$\mathsf{D.}\left(\frac{0.414}{100}\right)$$

#### Answer: A

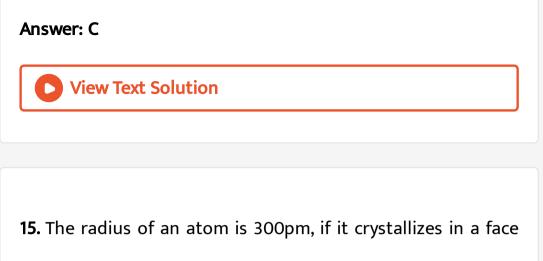
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**A.** 48 %

 $\mathsf{B}.\,23\,\%$ 

C. 32~%

D. 26~%



centered cubic lattice, the length of the edge of the unit cell

is ......

A. 488,5 on

B. 848,5 on

C. 884,5 on

D. 484.5 on

Answer: B



#### 16. The fraction of total volume occupied by the atoms in a

simple cubic is ................

A. 
$$\left(\frac{\pi}{4\sqrt{2}}\right)$$
  
B.  $\left(\frac{\pi}{6}\right)$   
C.  $\left(\frac{\pi}{6}\right)$   
D.  $\left(\frac{\pi}{3\sqrt{2}}\right)$ 

#### Answer: B



17. The yellow colour in NaCl crystal is due to .................

A. excitation of electrons in F centers

B. reflection f light from  $Cl^-$  ion on the surface

C. refraction of light from  $Na^+$  ion

D. all of the above

Answer: A



**18.** If 'a' stands for the edge length of the cubic system , sc, bcc, and fcc. Then the ratio of radii of spheres in these systems will be respectively.

A. 
$$\left(\frac{1}{2}a:\frac{\sqrt{3}}{2}a:\frac{\sqrt{2}}{2}a\right)$$
  
B.  $\left(\sqrt{1}a:\sqrt{3}a:\sqrt{2}a\right)$ 

C. 
$$\left(\frac{1}{2}a:\frac{\sqrt{3}}{4}a:\frac{1}{2\sqrt{2}}a\right)$$
  
D.  $\left(\frac{1}{2}a:\sqrt{3}a:\frac{1}{\sqrt{2}}a\right)$ 

#### Answer: C

**View Text Solution** 

**19.** If 'a' is the length of the side of the cube, the distance between the body centered atom and one corner atom in the cube will be ......

A. 
$$\left(\frac{2}{\sqrt{3}}\right)a$$
  
B.  $\left(\frac{4}{\sqrt{3}}\right)a$   
C.  $\left(\frac{\sqrt{3}}{4}\right)a$   
D.  $\left(\frac{\sqrt{3}}{2}\right)a$ 

#### Answer: D

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**20.** Potassium has a bcc structure with nearest neighbor distance 4.52Å. Its atomic weight is 39. its density will be

A. 915 kg m  $^{-3}$ 

B.  $2142 \text{ kg m}^{-3}$ 

C. 452 kg m  $^{-3}$ 

D. 390 kg m  $^{-3}$ 

Answer: A



21. Schottky defect in a crystal is observed when.....

A. unequal number of anions and anions are missing from

the lattice

B. equal number of anions and anions are missing from

the lattice

C. an ion leaves its normal site and occupies an interstitial

site

D. no ion is missing from its lattice.

**Answer: B** 

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**22.** The cation leaves its normal position in the crystal and moves to some interstitial position, the defect in the crystal

is known as .....

A. Schottky defect

B. F center

C. Frenkel defect

D. non-stoichiometric defect

#### Answer: C

View Text Solution

23. Assertion : due to Frenkel defect, density of the crystalline

solid decreases.

Reason : in Frenkel defect cation and anion leaves the crystal.

A. Both assertion and reason are true and reason is the

correct explanation of assertion.

B. Both assertion and reason are true but reason is not

the correct explanation of assertion.

C. Assertion is true but reason is false.

D. Both assertion and reason are false

#### Answer: D

View Text Solution								
24.	The	crystal	with	а	metal	deficiency	defect	
is	••••••							
A	A. NaC	l.						

 $\mathsf{B.}\,FeO$ 

C. ZnO

 $\mathsf{D}.\,KCI$ 

Answer: B

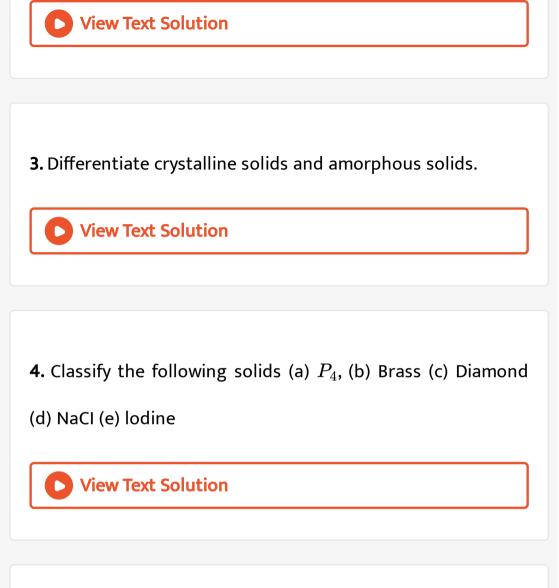


#### Textbook Evaluation Ii Answer The Following Questions

1. Define unit cell.



2. Give any three characteristics of ionic crystals.



5. Explain briefly seven types of unit cell.

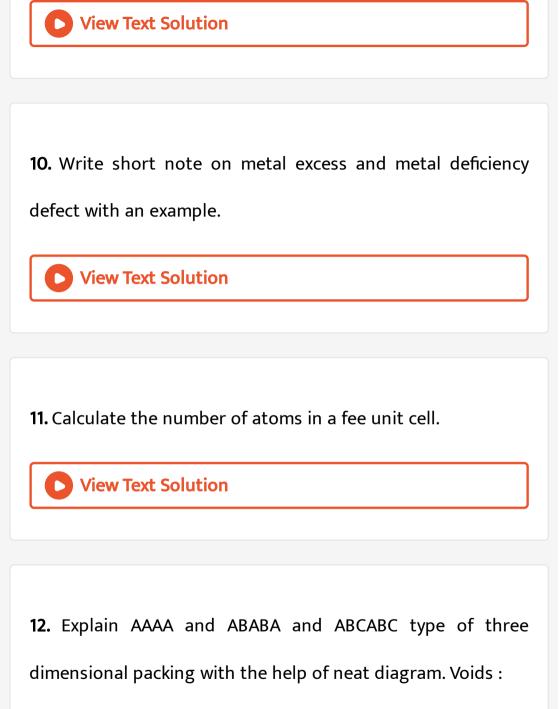
Seven types of unit cell,



**6.** Distinguish between hexagonal close packing and cubic close packing.

View Text Solution
7. Distinguish tetrahedral and octahedral voids.
View Text Solution
<b>8.</b> What are point defects ?
View Text Solution

9. Explain Schottky defect.



The empty spaces between the three dimensional layers are

known as voids. There are two types of common voids

possible. They are tetrahedral and octahedral voids.

Tetrahedral void:

A void formed by three spheres of a layer in contact with each other and also with a sphere on the top or bottom layer is a hole between four spheres. The spheres are arranged at the vertices of a regular tetrahedron such a hole or void is called tetrahedral void.

Octahedral void:

A hole or void formed by three spheres of a hexagonal layer and another three spheres of the adjacent layer is a hole between six spheres. The spheres are arranged at the vertices of a regular octahedron. Such a hole or void is called octahedral void.



13. Why ionic crystals are hard and brittle?

14. Calculate the percentage efficiency of packing in case of

body centered cubic crystal.

View Text Solution

15. What is the two dimensional coordination number of a

molecule in square close packed layer ?

View Text Solution

**16.** Experiment shows that Nickel oxide has the formula  $Ni_{0.96}O_{1.00}$ . What friction of Nickel exists as of  $Ni^{2+}$  and  $Ni^{3+}$  ions ?

View Text Solution

17. What is meant by the term "coordination number" ? What

is the coordination number of atoms in a bcc structure ?



**18.** An element has bcc structure with a cell edge of 208 pm. the density of the element is  $7.2gcm^{-3}$ . How many atoms are present in 208g of the element.



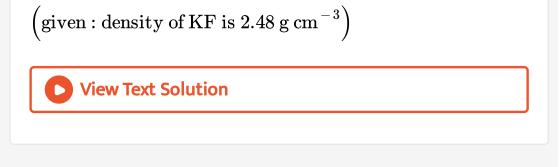
**19.** Aluminium crystallizes in a cubic close packed structure. Its metallic radius is 125pm. Calculate the edge length of unit cell.



**20.** If NaCl is doped with  $10^{-2}$  mol percentage of strontium chloride, what is the concentration of cation vacancy ?



**21.** KF crystallizes in fce structure like sodium chloride. calculate the distance between  $K^+$  and  $F^-$  in KF.



22. An atom crystallizes in fee erystal lattice and has a density of  $10 \text{ gcm}^{-3}$  with unit cell edge length of 100pm. calcutate the number of atoms present in 1 g of crystal.

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**23.** Atoms X and Y form bee erystalline structure. Atom X is present at the corners of the cube and Y is at the centre of the cube. What is the formula of the compound ?



24. Sodium metal crystallizes in bee structure with the edge length of the unit cell  $4.3 \times 10^-$  cm. Caleulate the radius of sodium atom.

View Text Solution
<b>25.</b> Write a note on Frenkel defect.
View Text Solution
Additional Questions I Choose The Best Answer
1. Consider the following statements
Solids have definite volume and shape

(ii) Solids are rigid and compressible

(iii) Solids have weak cohesive forces

Which of the above statemetns is/are not correct ?

A. (i) only

B. (ii) & (iii) only

C. (iii) only

D. (i) & (ii) only

**Answer: B** 

**D** View Text Solution

2. Which one of the following is an ionic crystal ?

A. Glass

B. Rubber

 $\mathsf{C}.\, NaCl$ 

D.  $SiO_2$ 

Answer: C

View Text Solution

3. Which one of the following is an amor-phous solid ?

A. Glass

B.  $SiO_2$ 

C. NaCl

D. Na

Answer: A





4. Which one of the following is an example for molecular

crystals ?

A. Diamond

B. Silica

C. Glass

D. Naphthalene

Answer: D



5. Which one of the following is an example for atomic solids

A. Frozen elements of group 18

B. Group 17 elements

C. Inner - transition elements

D. chalcogens

Answer: A

?

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6. Which one of the following is a covalent crystal ?

A. Glass

B. Diamond

C. Anthracene

D. Glucose

Answer: B



7. Consider the following statements.

- (i) Crystalline solids have irregular shape
- (ii) Generally crystalline solids are anisotropic in nature

(iii) Heat of fusion of crystalline solids are not definite at

Which of the above statements is /are correct ?

A. (i) & (iii)

B. (i) only

C. (iii) only

D. (ii) only

Answer: D

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8. Consider the following statements.

(i) Amorphous solids are isotropic like liquids

(ii) Amorphous solids are considered as pseudo solids

(iii) Amorphous solids have sharp melting points

Which of the above statemetns is/are correct?

A. (i) only

B. (ii) only

C. (i) & (ii)

D. (i) & (iii)

### Answer: C



**9.** In an ionic crystal, both cations and an- ions are bound together by.....

A. Strong electrostatic attractive forces

B. Weak electrostatic attractive forces

C. Vanderwaals forces of attraction

D. Weak cohesive forces

Answer: A



10. Molecular solids contains neutral molecules held together

by .....

A. strong cohesive forces

B. weak vanderwaals forces

C. weak ionic forces

D. strong electrostatic forces

**Answer: B** 



11. Which is used inside pencils and in many lubricants?

A. Lead nitrate

B. charcoal

C. graphite

D. coke

Answer: C

View Text Solution

12. In non polar molecular solids, molecules are held together

by .....

A. London forces

B. weak vanderwaals forces

C. Strong electrostatic forces

D. strong cohesive forces

### Answer: A



13. Which one of the following is non-polar molecular solids ?

A. Diamond

B. SiC

C. Anthracene

D. Glass

Answer: C



14. Silicon carbide is an example of

A. Ionic solid

B. Covalent solid

C. Polar molecular solid

D. Non - polar molecular solid

**Answer: B** 

View Text Solution

15. Naphthalene is an example of.....

A. ionic solid

B. covalent solid

C. non polar molecular solid

D. polar molecular solid

### Answer: C

**View Text Solution** 

**16.** Solid  $NH_3$  solid  $CO_2$  are examples of

A. Covalent solids

B. polar molecular solids

C. molecular solids

D. ionic solids

**Answer: B** 





17. Solids ice, glucose are examples of .....

A. metallic solids

B. ionic solids

C. hydrogen bonded molecular solids

D. non polar molecular solids

Answer: C

View Text Solution

**18.** Consider the following statements.

metallic solids possess high electrical and thermal

conductivity

(ii) solid ice are soft solids under room temperature

(iii) In non polar molecular solids constituent molecules are held together by strong electrostatic forces of attraction Which of the above statenments is/are not correct ?

A. (i) & (ii) only

B. (iii) only

C. (ii) only

D. (i) onlu

Answer: B



19. Each atom in the corner of the cubic unit cell is shared by

how many unit cells ?

A. 8

B. 6

C. 1

D. 12

### Answer: A

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**20.** Which is the coordination number of each atom in a simple cubic unit cell ?

A. 8

B. 6

C. 12

D. 4

Answer: B

View Text Solution

# 21. The number of atoms belongs to bcc unit cell is

A. 2

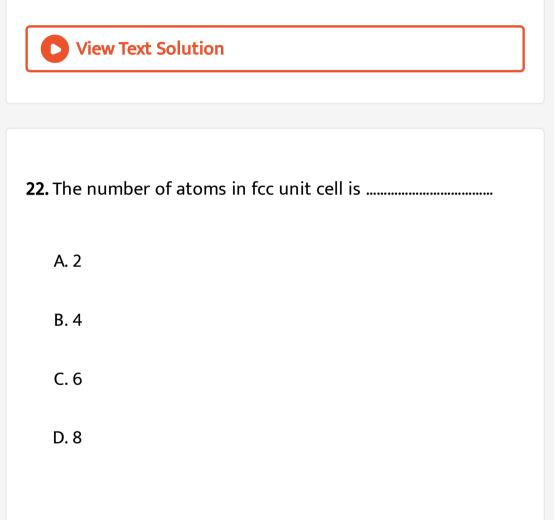
.....

B. 4

C. 6

D. 12

Answer: A



Answer: B



**23.** The atoms the face centre is being shared by ...... unit cells.

A. 4

B. 8

C. 2

D. 6

## Answer: C

**D** View Text Solution

**24.** An atom present at the body centre belongs to only ...... unit cell.

A. 1

B. 2

C. 4

D. 8

Answer: A

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25. Which one of the following is known as Bragg's equation ?

A. 
$$d = rac{2\sin\theta}{n\lambda}$$
  
B.  $d = rac{n\lambda}{2\sin\theta}$   
C.  $n\lambda = rac{d}{\sin\theta}$   
D.  $d = rac{2\sin\theta}{n\lambda}$ 

# Answer: D



**26.** Which one the following formula is used to calculate the density of the unit cell ?

A. 
$$ho=rac{nM}{a^3N_A}$$
  
B.  $ho=rac{a^3N_A}{nM}$   
C.  $ho=rac{N_A}{a^3NM}$   
D.  $ho=rac{a^3NM}{n}$ 

## Answer: A



27. Which is the packing fraction in simple cubic unit cell ?

A. 52.31~%

B. 100~%

 $\mathsf{C.}\,68\,\%$ 

D. 75~%

## Answer: A



**28.** The packing fraction in bcc arrangement is

A. 52.31~%

 $\mathbf{B.\,68~\%}$ 

C. 100~%

D. 80~%

Answer: B



**29.** Which is the coordination number in both hcp and ccp arrangements ?

A. 12

B. 6

C. 4

D. 8

Answer: A
View Text Solution
<b>30.</b> What is the coordination number of $B_2 0_3$ ?
A. 4
В. б
C. 8
D. 3
Answer: D
View Text Solution

**31.** Which one of the following is the structure of  $B_20_3$  ?

A. Tetra hedral

B. Octahedral

C. Trigonal planar

D. Cubic

Answer: C

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**32.** The coordination number of zinc sulphide is ......

••••••

B. 4

C. 6

D. 8

Answer: B



# 33. The coordination number of CsCl is .....

A. 3

B. 4

C. 6

D. 8

Answer: D
View Text Solution
<b>34.</b> Which one of the following is the coordination number of
NaCl ?
A. 3
B. 4
C. 6
D. 8
Answer: C

**O** View Text Solution

35. Which one of the following is the packing efficiency in fcc

# unit cell?

A. 74~%

 $\mathsf{B.}\,52.61\,\%$ 

C. 100 %

D. 68~%

Answer: A

View Text Solution

**36.** Which one of the following is an example for schottky defect ?

A. NaCl

 $\mathsf{B.}\,AgBr$ 

 $\mathsf{C}.\,KCI$ 

 $\mathsf{D.}\,FeS$ 

Answer: A



**37.** Which one of the following is an example for Frenkel defect ?

A. NaCl

B. AgCl

 $\mathsf{C.}\,AgBr$ 

D.  $AgNO_3$ 

Answer: C
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<b>38.</b> Metal excess defect is possible in
A. $AgCl$
B. $AgBr$
C. KCI
D. $FeS$
Answer: C

View Text Solution

39. Which one of the following is the metal deficiency defect ?

A. FeO

B. ZnO

 $\mathsf{C}.\,KCI$ 

 $\mathsf{D.}\, NaCI$ 

**Answer: A** 

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**40.** Which one of the following shows non- stoichiometric defect ?

 $\mathsf{B.}\,AgBr$ 

 $\mathsf{C}.\,ZnO$ 

D. Both a and c

Answer: A::B::C::D



Additional Questions Ii Fill In The Blanks

1. Naphthalene, Anthracene and glucose are examples of

View Text Solution

......

2.	The	best	examples	of cova	lent cr	ystals	are	•••••	and	•••••
----	-----	------	----------	---------	---------	--------	-----	-------	-----	-------

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<b>3.</b> Frozen elements of group 18 are called
View Text Solution
<b>4.</b> Glass, Rubber, plastics are the examples ofsolids.
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5. ..... means uniformity in all directions.





**6.** Crystalline solids are ..... and they show different values of physical properties when measured along different directions.



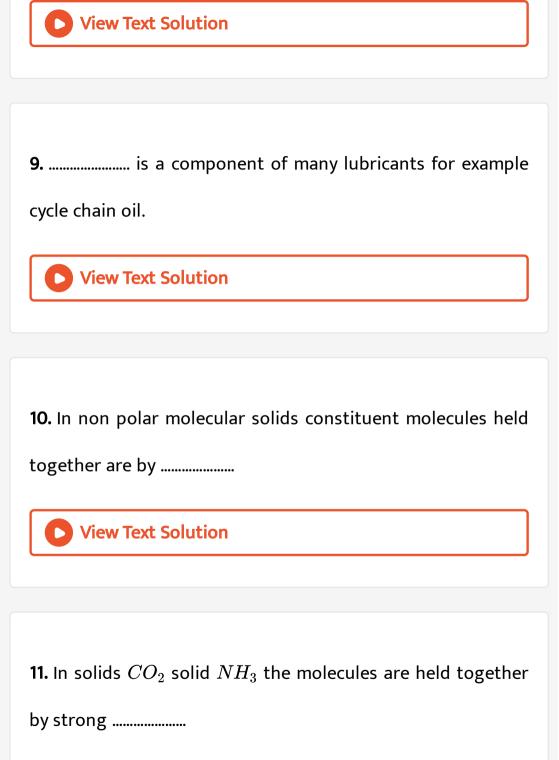
7. Diamond and silicon carbide are the examples of.....

solids.

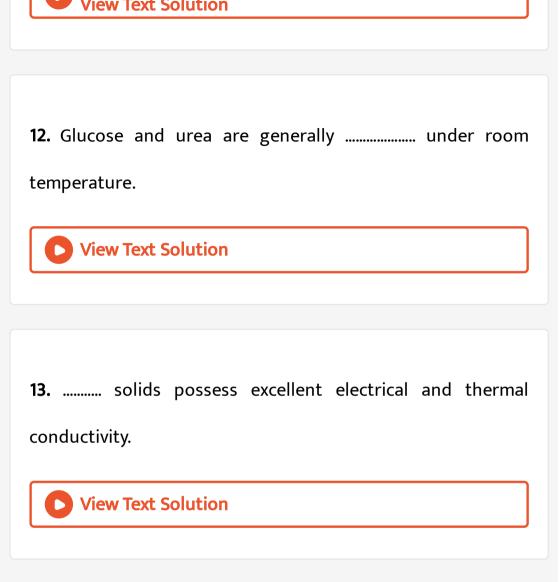


8. In molecular solids, the neutral molecules are held

together by weak .....







**14.** The regular arrangement of the ions throughout the crystal is called a.....

15. The basic repeating structural unit of a crystalline solid is

called a.....

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16. The number of the nearest neighbours that surrounding a

particle in a crystal is called the .....

**D** View Text Solution

**View Text Solution** 

...................

17. A unit cell that contains only one lattice point is called a

18. ..... is the most powerful tool for the determinaiton

of crystal structure.



19. Only..... of the available volume is occupied by the

spheres in simple cubic packing.



20. Of all the metals in the periodic table, only.....

crystallizes in simple cubic pattern.

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21. If the third layer arrangement is aba arrangement, it is

called .....arrangement.

View Text Solution
22. If third layer arrangement is abc arrangment, it is known
asarrangement.
View Text Solution
23. In both and arrangements, the
coordination number of each sphere is 12.
View Text Solution

**24.** ..... defect arises due to the missing of equal number of cations and anions from the crystal lattice.

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<b>25.</b> Vanadium monoxide shows defect.
View Text Solution
26 arises due to the dislocation of ions from its
crystal lattice.



27. ..... arises due to the presence of more number of

metalions as compared to anions.

View Text Solution
<b>28.</b> Zno is at room temperature but when it is
heated it become In colour
View Text Solution
<b>29.</b> arises due to the presence of less number of cations than the anions.
View Text Solution

**30.** ..... is the appearance of an electrical potential across the sides of the crystal, when it is subjected to mechanical stress.

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<b>31.</b> Stoichiometric defects in an ionic solid is also called or defect.
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Additional Questions Iii Match The Following

1. Match the list I and II using the code given below the list

- List I List II A. NaCl 1. Molecular crystal
- B.  $SiO_2$  2. Metallic crystal
- C.  $C_6H_{12}O_6$  3. Ionic crystal
- D. Copper 4. Covalent crystal

^	A	B	C	D
A.	3	4	C1	<b>2</b>
Р	A	B	$C \ 4$	D
в.	2	3	4	1
c	A	B	C	D
C.	A 4	$B \ 1$	$C \ 2$	D
			C 2 C 3	

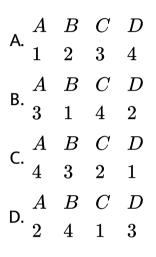
Answer: (a) 3, 4, 1, 2



List - I

- A. Atomic solid
- **2.** B. Molecular crystal 2. KCl C.Covalent crystal
  - D. Ionic crystal

- List II
- 1. Naphthalene
- - 3. Frozen elements of group 18
  - 4. Diamond

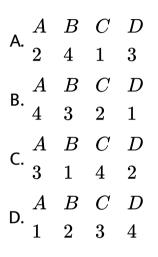


Answer: (b) 3, 1, 4, 2



List - I

- A. Covalent solid
- **3.** B. Non polar molecular solid
  - C. Polar molecular solid
  - D. Hydrogen bonded molecular solids 4. Anthracene

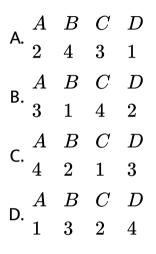


Answer: (a) 2, 4, 1, 3



- List II
- 1. Solid  $CO_2$
- 2. SiC
- 3. Solid ice

List - I	$\operatorname{List}$ - $\operatorname{II}$
A. Schottky defect	A. AgBr
<b>4.</b> B. Frenkel defect	$2.  \mathrm{FeO}$
C. Metal excess defect	3. NaCl
D. Metal deficiency defect	4. ZnO



Answer: (b) 3, 1, 4, 2



- 5.
- List I
- A. Bragg's equation
- B. Density of unit cell 2.
- C. Packing efficiency 3.  $\frac{r_{c^+}}{r_{A^-}}$
- D. Radius ratio

٨	A	B	C	D
A.	3	4	$C \ 1$	2
в.	1	2	C	4
c	A	B	C	D
C.	$A \ 4$	B1	$C \ 2$	$D \ 3$
			C 2 C 4	

List - II 1.  $\frac{nM}{a^3N_A}$ 2.  $\frac{\text{Total volume of all spheres in unit cell}}{\text{Volume of unit cell}} \times 100$ 3.  $\frac{r_{c^+}}{}$ 

4.  $n\lambda = 2d\sin\theta$ 

### Answer: (c)4, 1, 2, 3

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Additional Questions Iv Assertion And Reason

 Assertion (A) : Amorphous solids are isotropic in nature.
 Reason (R) : In amorphous solids, they have identical values of physical properties such as refractive index, electrical conductance in all directions which is called isotropy.

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

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

explanation of A

C. A is correct but R is wrong

D. A is wrong but R is correct

#### Answer: a



**2.** Assertion (A) : Crystalline solids are anisotropic in nature. Reason (R) : Anisotropy is the property which depends on the direction of measurement. Crystalline solids are anisotropic and they show different values of physical properties when measured along different directions. Both A and R are correct and R is the correct explanation of A.

- A. Both A and R are correct and R is the correct explanation of A.
  - B. Both A and R are correct but R is not the correct explanation of A
  - C. A is correct but R is wrong
  - D. A is wrong but R is correct

### Answer: a



**3.** Assertion (A) : Ionic solids do not conduct electricity in solid state but in molten state they conduct electricity. Reason (R) : In solid state, the ions are fixed in their lattice positions but in molten state, the ions are free to move and conduct electricity

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

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

C. A is correct but R is wrong

D. A is wrong but R is correct

### Answer: b



**4.** Assertion (A) : Diamond and Silicon carbide are very hard and have high melting point.

Reason (R) : In covalent solids, the atoms are bound together in a three dimensional network entirely by covalent bonds.

A. Both A and R are correct but R is not the correct

explanation of A

B. Both A and R are correct and R is the correct

explanation of A.

C. A is correct but R is wrong

D. A is wrong but R is correct

#### Answer: a

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**5.** Assertion (A) : Solid  $CO_2$  Solid  $NH_3$  have higher melting points

Reason (R): The constituents are molecules formed by polar covalent bonds. They are held together by relatively strong dipole- dipole interactions.

A. A is correct but R is wrong

B. A is wrong but R is correct

C. A and R are correct and R is the correct explanation of

Α.

D. A and R are correct but R is not the correct explanation

of A

Answer: c

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6. Assertion (A) : Solid ice, Glucose are generally soft solids under room temperature
Reason (R): The constituents are held together by strong electrostatic forces of attraction

A. Both A and R are correct and R is the correct

explanation of A.

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

explanation of A

C. A is correct but R is wrong

D. A is wrong but R is correct

Answer: c



**7.** Assertion (A) : In bcc, the available volume is more efficiently used than in simple cubic packing.

Reason (R) : In simple cubic arrangement, the number of

spheres belongs to a unit cell is equal to one whereas in bcc, it is equal to 2.

A. Both A and R are correct and R is the correct

explanation of A.

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

explanation of A

C. A is correct but R is wrong

D. A is wrong but R is correct

Answer: a



**8.** Assertion (A) :  $B_2O_3$  has trigonal planar structure.

Reason (R) : The ratio of radius of cation and anion  $\frac{r_{c^+}}{r_{A^-}} = 0.155 - 0.225$  plays an important role in determining the structure and  $B_2O_3$  has coordination number as 3 and has trigonal planar structure.

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

explanation of A

- C. A is correct but R is wrong
- D. A is wrong but R is correct

#### Answer: a

**9.** Assertion (A) : Schottky defect does not change the stoichiometry of the crystal.

Reason (R) : This defect arises due to the missing of equal number of cations and anions from the crystal lattice.

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

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

C. A is correct but R is wrong.

D. A is wrong but R is correct

### Answer: b

10. Assertion (A) : Zinc oxide is colourless at room temperature but on heating it becomes yellow in colour. Reason (R) : On heating Zinc loses oxygen and thereby forming free  $Zn^{2+}$  ions. The excess  $Zn^{2+}$  ions move to interstitial sites and the electrons also occupy interstitial positions.

- A. Both A and R are correct and R is the correct explanation of A.
- B. Both A and R are correct but R is not the correct explanation of A
- C. A is correct but R is wrong
- D. A is wrong but R is correct

## Answer: a

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Additional Questions V Find The Odd One Out

1. Find the odd one out

A. Plastic

B. Rubber

C. Glucose

D. Glass

Answer: c



2. Find the odd one out

A. Anthracene

B. Naphthalene

C. Glucose

D. Sodium chloride

Answer: d

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3. Find the odd one out

A. Sodium

**B.** Pottasium

C. Frozen elements of group 18

D. Gold

Answer: c



4. Find the odd one out

A. Solid  $Co_2$ 

B. Solid ice

C. Glucose

D. Urea

### Answer: a

**D** View Text Solution

5. Find the odd one out

A. Cubic

B. Rhombohedral

C. Hexagonal

D. Cyclic

Answer: d



1. Find out the correct pair

A. Glass, plastic

B. Rubber, ice

C. Nacl, Glucose

D. Urea, solid  $NH_3$ 

Answer: a



2. Find out the correct pair

A. NaCl, KCI

B. FeO, ZnO

C.  $AgBr, AgNO_3$ 

D. VO, ZnO

Answer: a



3. Find out the correct pair

A. Solid  $CO_2$ , Solid ice

B. Solid  $CO_2$  Solid  $NH_3$ 

C. Graphite, Silicon carbide

D. Naphthalene, Phenol

# Answer: b

**D** View Text Solution

4. Find out the correct pair

A. NaCI, SiC

B. Naphthalene, anthracene

C. Solid ice, graphite

D. Copper, KCI

Answer: b



1. Find out the incorrect pair

A. NaCI, KCI

B. Naphthalene, anthracene

C. Solid  $CO_2$  Solid  $NH_3$ 

D. Diamond, solid ice

Answer: d



2. Find out the incorrect pair

A. Cu, Fe

B. Glucose, Urea

C. Diamond, SiC

D. Benzene, glucose

Answer: d

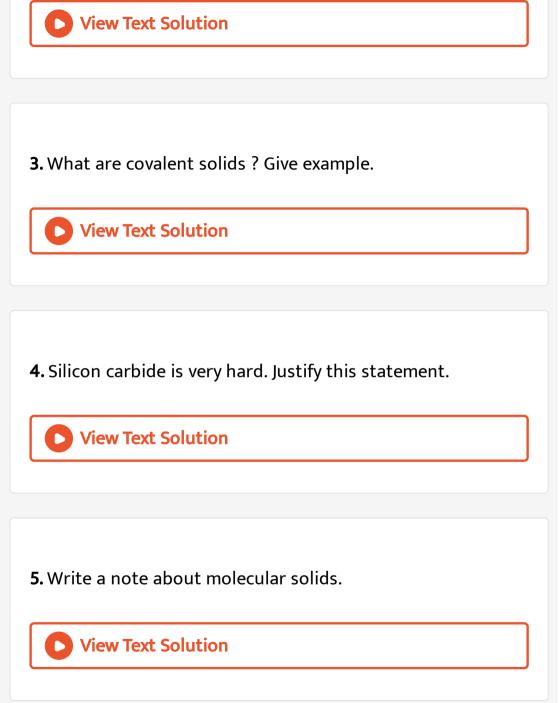


Additional Questions 2 Mark Questions

1. What are crystalline solid ? Give example.



2. What are amorphous solid ? Give example.

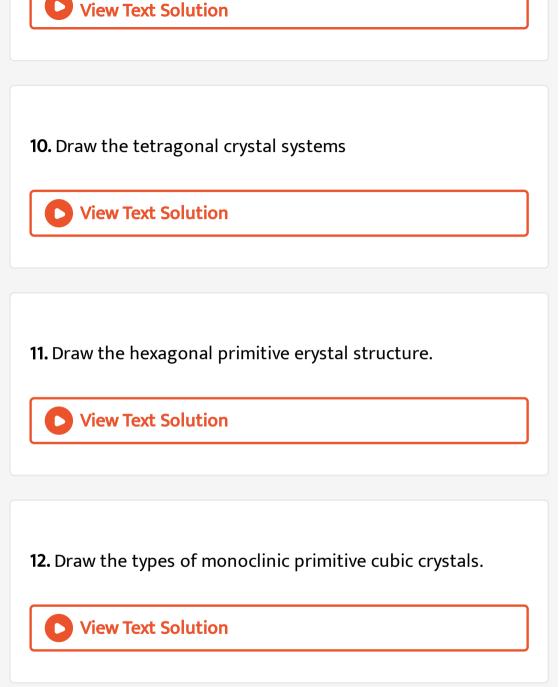


6. What are non-polar molecular solids ? Give example.

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<b>7.</b> What are hydrogen bonded molecular solids ? Give example.
View Text Solution
<b>8.</b> Define crystal lattice.
View Text Solution

9. Define coordination number.





13. Draw the primitive cubes (i) trigonal (i) triclinic

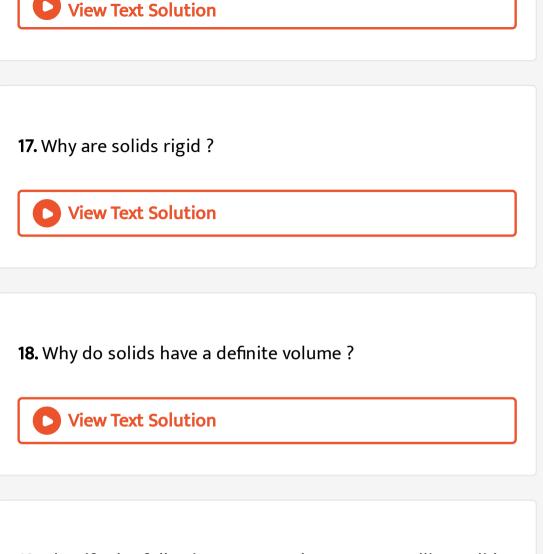
<b>14.</b> What is Bragg's equation ?
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15. What is meant by linear arrangement of spheres in one

direction ?



16. What is meant by Piezo electricity?



**19.** Classify the following as amorphous or crystalline solids : Polyurethane, naphthalene, benzoic acid, teflon, potassium nitrate, cellophane, polyvinyl chloride, fibre glass, copper.



20. Why is glass considered as super cooled liquid ?



**21.** Refractive index of a solid is observed to have the same value along all directions. Comment on the nature of this solid. Would it show cleavage property?



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**22.** Classify the following solids in different categories based on the nature of intermolecular forces operating in them : Potassium sulphate, tin, benzene, urea, ammonia, water, zinc sulphide, graphite, rubidium, argon, silicon carbide.



23. Solid A is a very hard electrical insulator in solid as well as in molten state, and melts at extremely high temperature.What type of solid is it ?



**24.** Ionic solids conduct electricity in molten state but not in solid state, Explain.



25. An element with molar mass  $2.7 \times 10^{-2}$  kg mol<sup>-1</sup> forms a cubic unit cell with edge length 405 pm. If the density is  $2.7 imes 10^3 ~~{
m kg}\,{
m m}^{-3}$  , what is the nature of the cubice unit cell?



**26.** Ionic solids, which have anionic vacancies due to metal excess defect develop colour. Explain with the help of suitable example.

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**27.** Classify each of the following solids as ionic, metallic, molecular, network (covalent) or amorphous. (i) Tetra phosphorous decoxide  $(P_4O_{10})$  (ii) Ammonium Phosphate  $(NH_4)_3, PO_4$ ) (iii) Sic (iv)  $I_2$  (v) P4 (vi) Plastic (vii) Graphite (viii) Brass (ix) Rb (x) LiBr (xi) Si





**28.** What is the formula of a compound in which the element Y forms cep Lattice and atoms of X occupy 2/3rd of tetrahedral voids ?



**29.** The energy required to vapourise one mole of copper is smaller than that of energy required to vapourise 1 mol of diamond. Why ?



**30.** Assign reason for the following :

(i) phosphorous doped silicon is a semiconductor.

(ii) Schottky defect lowers the density of a solid.

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Additional Questions 3 Mark Questions
<b>1.</b> Distinguish between isotropy and anisotropy ?
View Text Solution
<b>2.</b> What are polar molecular solids ? Give example.

View Text Solution

**3.** Write a note about metallie solids.

View Text Solution
<b>4.</b> What are characteristic parameters of a unit cell ?
View Text Solution
<b>5.</b> What are type of unit cells ? Give their names.
View Text Solution

6. Draw the seven types of primitive erystal systems.



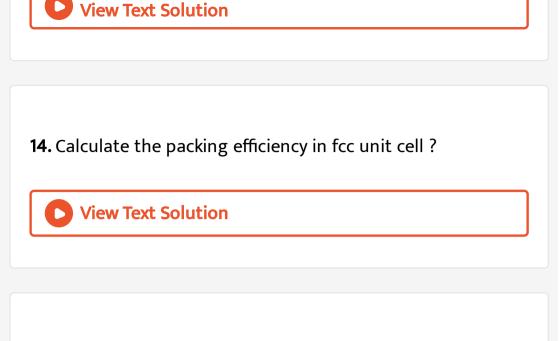
<b>7.</b> Draw the types of cubic crystal systems.
View Text Solution
<b>8.</b> Draw the types of orthorhombic cubic crystal systems.
View Text Solution
9. Calculate the number of atoms belong to one unit cell of
simple cubic unit cell(sc)
View Text Solution

**10.** Calculate the number of atoms per unit cell of bee type.

View Text Solution
<b>11.</b> How will derive the formula of density of a unit cell ?
<b>D</b> View Text Solution
<b>12.</b> Calculate the packing fraction of simple cubic
arrangement.
_
View Text Solution

13. What is meant by packing efficiency ? How is it measured ?





15. How is radius ratio is useful in determination of structure

of an lonic compound ?

**D** View Text Solution

16. What is meant by impurity defect ? Explain with example ?

View Text Solution

17. A compound is formed by two elements M and N. The element N forms ccp and atoms of M occupy 1/3 rd of the tetrahedral voids. What is the formula of the compound ?



**18.** How many lattice points are there in one unit cell of each

of the following lattice ?

(i)Face-centred cubic (ii) Face-centred tetragonal (iii) Body-

centered



19. Explain:

(i) The basis of similarities and differences between metallic

and ionic crystals.

(ii) lonic solids are hard and brittle.

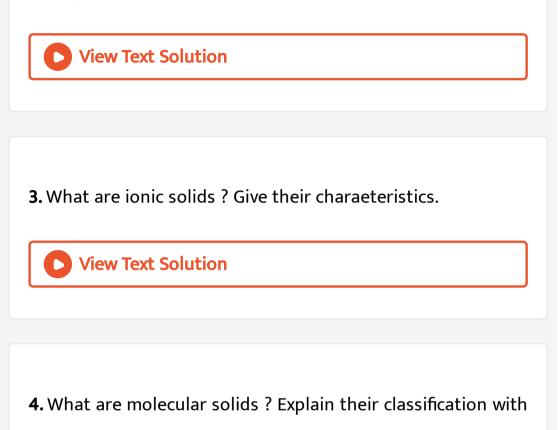
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<b>20.</b> $ZnO$ is colourless at room temperature, while yellow when hot. Why ?
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Additional Questions 5 Mark Questions

1. What are general characteristics of solids ?



2. Write a note about classification of solids with suitable

examples.



suitable examples.



5. An element crystallizes in a fee lattice with cell edge of 400

pm. The density of the element is  $7g\,/\,cm3$ . How many atoms

one present in 280 g of the element ?

