CHEMISTRY

BOOKS - NCERT CHEMISTRY (ENGLISH)

SOLID STATE

Multiple Choice Question Mcqs

1. which of the following favours the existence of a substance in the solid state ?

a) High temperature

b) Low temperature

c) High thermal energy

d) Weak cohesive forces

A. High temperature

B. Low temperature

C. high thermal enery

D. Weak cohesive forces

Answer: B

Watch Video Solution

2. which of the following is not a characteristic of a crystalline solid ? (a) Definite and characteristic heat of fusion. (b) Isotropic nature (c) A regular periodically repeated pattern of arrangement of constituent particles in the entire crystal. (d) A true solid.

A. Define and characterstic heat of fusion

B. Isotropic nature

C. A regular periodically repeated pattern of arrangement of consituent particles in the entire crystal

D. A true solid

Answer: B

Watch Video Solution

3. Which of the following is an amorphous solid? (1) Teflon (2) Cellophane (3) Poly vinyl chloride (4) Fibre glass (5) All of these

A. Graphite (C)

B. Quartz glass (SiO_2)

C. Chrome alum

D. Silicon carbide (SiC)

Answer: B

Watch Video Solution

4. which of the following arrangements shows schematic alignment magnetic moments of antiferromagnetic substances?

A. 

B. 

C. 

D. 

Answer: D

Watch Video Solution

5. which of the following is true about the value of refractive index of quartz glass ? a) Same in all directions b) Different in all

directions c) Can not be measured d) Always zero

A. Same in all directions

B. Different in different directions

C. Cannot be measured

D. Always zero

Answer: A

Watch Video Solution

6. Which of the following statement is not true about amorphous solids? (a) On heating, they may become crystalline at certain temperature. (b) They may become crystalline on keeping for long time. (c) Amorphous solids can be moulded by heating. (d) They are anisotropic in nature.

A. on heating they may become crystalline at certain temperature

B. they may become crystlline on keeping for long time

C. Amorphous solids can be moulded by heating

D. they are aniotropic in a nature

Answer: D

Watch Video Solution

7. The sharp melting point of crystalline solids compared to amorphous solids is due to

a) a regular arrangement of constituent particles observed over a short distance in the

crystal lattice.

b) a regular arrangement of constituent particles observed over a long distance in the crystal lattice.

c) Same arrangement of constituent particles in different directions.

d) Different arrangement of constituent particles in different directions.

A. a regular arrangement of constituent partticles observed over a short distance in the crystal lattice

B. a regaular arrangment of constituent particles observed over a long distance in the crystal lattivce

C. same arrangement fo constituent particles in different directions

D. different arrangment of consittuent particles in different directions

Answer: B

 Watch Video Solution

8. Iodine molecules are held in the crystal lattice by: a) London forces b) dipole-dipole interactions c) Covalent bonds d) Coulombic forces

A. London forces

B. Dipole -dippole interactions

C. Covvalent bonds

D. Coulombic forces

Answer: A

 Watch Video Solution

9. which of the following is a network solid? a) Sulphur dioxide (Solid) b) Iodine c) Diamond d) Ice

A. $SO_2(\text{solid})$

B. I_2

C. Diamond

D. H_2O (ice)

Answer: C

Watch Video Solution

Watch Video Solution

10. which of the following solids is not an electrical conductor ?

(a) Mg(s) (b) TiO(s) (c) $I_2(s)$ (d) $H_2O(s)$

A. only 1

B. only 2

C. 3 and 4

D. 2,3 and 4

Answer: C

Watch Video Solution

11. which of the following is not the characteristic of ionic solids?

A. Very low value of electrical conductivity in the molten state

B. Brittle strong forces of interactions

C. Very strong forces of interactons

D. Anisotropic nature

Answer: A

Watch Video Solution

12. Graphite is a good conductor of electricity due to the presence of ..... .

A. Lone pair of electrons

B. Free Valence electrons

C. Cations

D. anions

Answer: B

Watch Video Solution

Watch Video Solution

13. which of the following oxides behaves as conductor or insulator depending upon temperature ?

(a)TiO

(b)SiO_2

(c)TiO_3

(d) MgO

A. TiO

B. SiO_2

C. TiO_3

D. MgO

Answer: C

Watch Video Solution

14. which of the following oxides shows electrical properties like metals ?

A. SiO_2

B. MgO

C. $SO_2(s)$

D. CrO_2

Answer: D

Watch Video Solution

15. The lattice site in a pure crystal cannot be occupied by :

A. molecule

B. ion

C. electron

D. atom

Answer: C

Watch Video Solution

16. graphite cannot be classifed as ..... .

A. conducting solid

B. network solid

C. Covalent solid

D. ionic solid

Answer: D

Watch Video Solution

17. Cations are present in the interstitial sites in ..... .

A. Frenkel defect

B. Schottky defect

C. Vacancy defect

D. metal deficiency defect

Answer: A

 Watch Video Solution

18. Schottky defect is observed in crystals when ..... .

A. some cations move from their lattice site to intersititial sites

B. equal number of cations and anions are missing form the lattice

C. some lattice sites are occupied by electrons

D. some impurity is present in the lattice

Answer: B

 Watch Video Solution

19. which of the following is true about the change the charge acquired by p- type semiconductors ?

A. Positive

B. Neutral

C. Neagative

D. Depends on conentraton of p impurity

Answer: B

Watch Video Solution

20. to get a n- type semiconductor from silicon , it should be doped with a sustance with valency..... .

A. 2

B. 1

C. 3

D. 5

Answer: D

Watch Video Solution

21. The total of tetrahedral voids in the face centred unit cell is ..... .

A. 6

B. 8

C. 10

D. 12

Answer: B

Watch Video Solution

22. which of the following point defects are shoen by AgBr (s) crystals ?

(a) Schottky defect

(b) Frenkel defect

(c) metal ecxess defect

(d) Metal deficiency defect

A. 1 and 2

B. 3 and 4

C. 1and 3

D. 2 and 4

Answer: A

Watch Video Solution

23. In which pair most efficient packing is present?

A. Hcp and bcc

B. hcp and ccp

C. bcc and ccp

D. bcc and simple cubic cell

Answer: B

Watch Video Solution

24. Percentage of free space in cubic in a body-centred cubic unit cell is .

A. 74

B. 68

C. 32

D. 26

Answer: C

 Watch Video Solution

25. which of the following statemets is not true about the hexagonal close packing ?

A. the coordination number is 12

B. it has 74 % packing efficiency

C. Tetrahedral voids of the second layer are covered by the sphere of the third layer

D. in this arrangment spheres of the fouth layer are exactly alingened with those of the first layer

Answer: D

Watch Video Solution

26. in which of the following strutures corrding number for cations and anions in the packed structure will be same ?

A. Cl^- ions form fcc lattice and Na^+ ions occupy all octahedral voids of the unit cell

B. Ca^{2+} ions form fcc lattice and F^- ions occupy all the eight tetrahedral voids of the unit cell

C. O^{2-} ions form fcc lattice and Na^+ ions occupy all the eight tetrahedral voids of the unit cell

D. S^{2-} ions form fcc lattice and Zn^{2+} ions go into go into alternate tetrahedral voids of the unit cell

Answer: A

Watch Video Solution

27. What is the coordination number in a square close packed structures in two dimensions?

A. 2

B. 3

C. 4

D. 6

Answer: C

Watch Video Solution

28. which kind of defects are introduced by doping ?

A. Dislocation defect

B. Schottky defect

C. Frenkel defect

D. Electronic defect

Answer: D

Watch Video Solution

29. silicon doped with electron rich impurity forms ..... .

A. p- type semiconductor

B. n- type semicondutor

C. intrinsic semiconductor

D. insulation

Answer: B

Watch Video Solution

30. which of the following statements is not true ?

A. Paramagnetic substances are weakly attracted by magnetic field

B. Ferromagnetic substance cannot be magnetised permanently

C. the domains in antiferromagnetic substance are oppositely oriented with respect to each other

D. Paring of electrons cancels their magnetic moment in the diamagnetic substances

Answer: B

31. which of the following is not true about the ionic solids ?

(a)Bigger ions form the close packed structure

(b)smaller ions either occupy the tetrahedral or the octahedral voids depending upon their size

(c)Occupation of all voids is not necessary

(d)the fraction of octahedral or tetrahedral

voids occupied depends upon the radii of the ions occupying the voids

A. Bigger ions form the close packed structure

B. smaller ions either occupy the tetrahedral or the octahedral voids depending upon their size

C. Occupation of all voids is not necessary

D. the fraction of octahedral or tetrahedral voids occupied depends upon the radii

of the ions occupying the voids

Answer: D

Watch Video Solution

32. A ferromagnetic substance becomes a permanent magnet when it is placed in a magnetic field because:

A. all the domains get oriented in the direction of magnetic field

B. all the domains get oriented in the direction opposite to the direaction o magnetic field

C. Domains get ori ented randomy

D. Domains are not affected by magnetic field

Answer: A

Watch Video Solution

33. the correct order of the packing effeciency in different types of unit cells is ..... .

A. fccltBcclt simple cubic

B. fccgt bcc gt simple cubic

C. fcclt bcc? Simple cubic

D. bcclt fccgt simple cubic

Answer: B

Watch Video Solution

34. which of the follwing defects is also known as dislocation defect ?

A. Frenkel defect

B. Schottky defect

C. Non- stoichiometric defect

D. simple inter stitial defect

Answer: A

Watch Video Solution

35. in the cubic packing , the unit cell has ..... .

A. 4 tetrahedral voids each of which is shared by four adjacent unit cells

B. 4 tetrahedral voids within the unit cell

C. 8 tetrahedral voids each of which is shared by four adjacent unit cells

D. 8 tetrahedral voids within the unit cells

Answer: D

 Watch Video Solution

36. the edge langth of the unit cells in terms of the radius of sphere constituting fcc ,bcc and simple cubic unit cells are respectively ..... .

A. $2\sqrt{2r}, \frac{4r}{\sqrt{3}}, 2r$

B. $\frac{4r}{\sqrt{3}}, 2\sqrt{2r}, 2r$

C. $2r, 2\sqrt{2r}, \frac{4r}{\sqrt{3}}$

D. $2r, \frac{4r}{\sqrt{3}}, 2\sqrt{2r}$

Answer: A

Watch Video Solution

37. which of the following repesents correct order of conductivity in solids ?

A. $k_{\text{metals}} > > k_{\text{insulators}} < k_{\text{semiconductors}}$

B. $k_{\text{metals}} < < k_{\text{insulators}} < k_{\text{semiconductors}}$

C.

$k_{\text{metals}} \cdot , k_{\text{semiconductors}} > k_{\text{insulations}} = zero$

D.

$k_{\text{metals}} \cdot , k_{\text{semiconductors}} > k_{\text{insulations}} \neq zero$

Answer: A

 Watch Video Solution

38. Which of the following is not true about the voids formed in 3 dimensional hexagonal close packed structure?

A. A tetrahedral void is formed when a sphere of the second layer is present above triangular void in the first layer

B. all the triangular voids in the first layer

C. tetrahedral voids are formed when the triangular voids in the second layer lie above the first layer and the triangular shpes of these voids do not overlap

D. Octahedral voids are formed when the triangular voids in the second layer exctly overlap with similar voids in the first layer

Answer: C,D

View Text Solution

39. the value of magnetic moment is zero in the case of antiferromagnetic substaence because the domains ..... .

A. get oriented in the direction of the applied magnetic fleid

B. get oriented opposite to the direction to the direction of the appiled magnetic fleld

C. are oppositely oriented with respect to each other without the application of magnetic field

D. cancel out each other 's magnetic moment

Answer: C,D

 Watch Video Solution

40. which of the following statement are not true ?

(a) Vacancy defect results in a decrease in the density of the substance

(b)interstitial defects results in an increase in the density of the substance

(c)impurity defect has no effect on the density of the substance

(d)Frenkel defect results results in an increase in the density of the substance

A. Vacancy defect results in a decrease in the density of the substance

B. interstitial defects results in an increase in the density of the substance

C. impurity defect has no effect on the density of the substance

D. Frenkel defect results results I n an increase in the density of the substance

Answer: C,D

 Watch Video Solution

41. which of the following statements are true about metals ?

(a) Valence band overlaps with conduction band

(b)the gap between valence band and conduction band is negligible

(c) the gap[between valence band and conduction band cannot be determined

(d) Valence band may remain partially filled

A. Valence band overlaps with conduction band

B. the gap between valence band and conduction band is negligible

C. the gap[between valence band and conduction band cannot be determinted

D. Valence band may ramain partially filled

Answer: A,B,D

Watch Video Solution

42. under the influence of electric field , which of the following statement is true about the movement of electrons and holes in p- type semiconducter ?

A. Electron will move towards the positively charged plate through electron holes

B. Holes will appear to be moving towards the negatively chared plate

C. both electrons and holes appear to move towards the positively charged

plate

D. Movement of elecrons Is not reated to the movement of holes

Answer: A,B

43. which of the following statements are true about semiconductor ?

(a)silicon doped with electron rich impurity is a p-type semiconductor

(b)Silicon doped with an electrons rich impurity is an n-type semiconductor

(c)Delocalised electrons increase the conductivity of doped silicon

(d)An electron vacancy increase the conductivity of n- type semiconductor

A. silicon doped with electron rich impurity is a p-type semiconductor

B. Silicon doped with an electrons rich impuriy is an n-type semipucoter

C. Delocalised electrons increase the conductivity of doped silicon

D. An electron vacancy incease the conductivity of n- type semiconductor

Answer: B,C

Watch Video Solution

44. An excess of potassium ions makes KCL crystals appear violet or lilac in colour since ..... .

A. some of the anionic sites are occupied by an unpaired electron

B. some of the anionic sites are occupied by an pair of electrons

C. there are vacancies at some anionic sites

D. F - centres are created which impart colour to the crystals

Answer: A,D

Watch Video Solution

45. the number of tetrahedral voids per unit cell in NaCl crystal is ..... .

A. 4

B. 8

C. twice the number of octahedral voids

D. Four times the number of octahedral voids

Answer: B,C

 Watch Video Solution

46. Amorphous solids can also be callled .....

.

A. pseudo solids

B. true solids

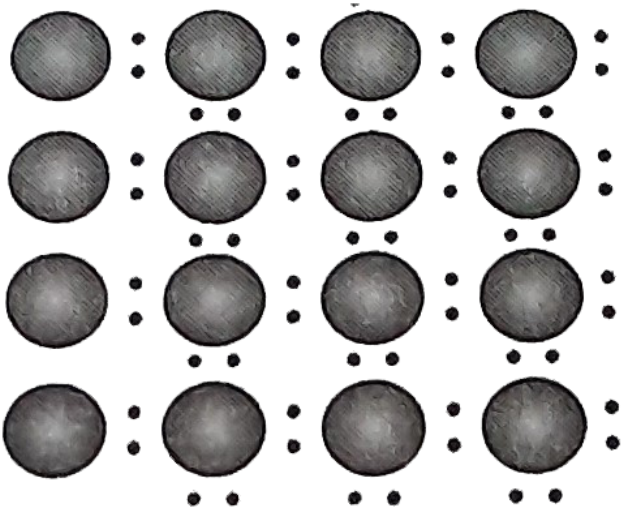
C. super cooled liquids

D. super cooled solids

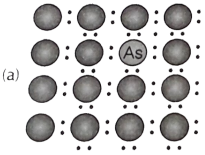
Answer: A,C

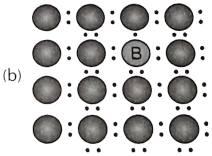
Watch Video Solution

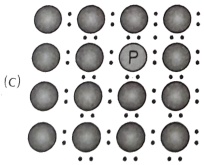
47. A perfect crystal of silicon (fig) is deped with some elements as given in the options , which of these options shows n- type semicondutors ?

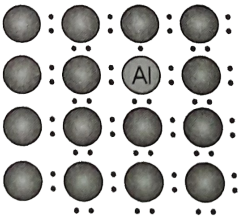


Pure crystal

A. 

B. 

C. 

D. 

Answer: A,C

Watch Video Solution

48. which of the following statements are correct ?

(a)Ferrimagnetic substance lose ferrimagnetism on heating and become paramagnetic

(b)Ferrimagnetic substance do not lose ferrimagnetism on heating and Remain ferromagnetic

(c)Antiferromgnetic substance have domain structures similar to ferromagnetic substance and their magnetic moment are not cancelled by each other

(d)Antiferromagnetic substance have domain structures similar to ferromagnetic substance and their magnetic moment are not cancelled by each other

A. Ferrimagnetic substance lose ferrimagnetism on heating and become paramagetic

B. Ferrimagnetic substance do not lose ferrimagnetism on heating and Reamain ferrmagnetic

C. Antiferromgnetic substance have domain structures simolar to ferromagnetic substance and their magngnetic moment are not cancelled by eash other

D. in ferromagnetic substance , all the domains get oriented in the directon of magnetic field and ramain as such even after removing magnetic field

Answer: A,D

Watch Video Solution

49. which of the following feastures are not shown by quartz glass ?

A. this is a crystalline solid

B. Refractive index is same in all the directions

C. this has define heat of fusion

D. this is also called super cooled liquid

Answer: A,C

Watch Video Solution

50. which of the following cannot regarded as molecular solid ?

A. AiC (silicon carbide)

B. AIN

C. Diamond

D. I_2

Answer: A,B,D

 Watch Video Solution

51. in which of the following arrangement octahedral voids are formed ?

A. hcp

B. bcc

C. simple cubic

D. fcc

Answer: A,D

Watch Video Solution

52. Frenkel defect is also known as ..... .

A. Soichiometric defect

B. dislocation defect

C. impurity defect has no effect on the density of the substance

D. non- stoichometric defect

Answer: A,B

Watch Video Solution

53. which of the following defects decrase the density decrease the density ?

A. interstitial defect

B. Vacancy defect

C. Frenkel defect

D. Schottky defect

Answer: B,D

Watch Video Solution

Short Answer Type Questions

1. Why are liquids and gases categorised as fluids ?

Watch Video Solution

2. Why are solids incompressible ?

Watch Video Solution

3. Inspite of long range order in the arrangement of particles why are the crystals usually not perfect ?

Watch Video Solution

4. Why common salt $(NaCl)$ sometimes appear yellow?

Watch Video Solution

5. why is FeO(s) not formed in stoichiometric compostion ?

Watch Video Solution

6. why does white ZnO(s) becomes yellow upon heating ?

Watch Video Solution

7. why does the electrical conductivity of semiconductors increase with rise in temperature?

Watch Video Solution

8. Explain why does conductivity of germainum crystals increase on doping with galium ?

Watch Video Solution

9. A compound formed by two elements M and N. Element N forms ccp and atoms of M occupy $1/3rd$ of tetrahedral voids. What is the formula of th compound?

Watch Video Solution

10. Under which situations can an amorphous substance change to crystaline form?

Watch Video Solution

11. match the type of unit cell given column I with the features iven in Column II .

Column I	Column II
A. Primitive cubic unit cell	1. Each of the three perpendicular edges compulsorily have the different edge length *i.e.*, $a \neq b \neq c$
B. Body centred cubic unit cell	2. Number of atoms per unit cell is one
C. Face centred cubic unit cell	3. Each of the three perpendicular edges compulsorily have the same edge length *i.e.*, $a = b = c$
D. End centred orthorhombic unit cell	4. In addition to the contribution from the corner atoms the number of atoms present in a unit cell is one
	5. In addition to the contribution from the corner atoms the number of atoms present in a unit cell is three

Watch Video Solution

12. match the types of defect given in column I with the statement given in column II.

	Column I		Column II
A.	Impurity defect	1.	NaCl with anionic sites called F-centres
B.	Metal excess defect	2.	FeO with Fe^{3+}
C.	Metal deficiency defect	3.	NaCl with Sr^{2+} and some cationic sites vacant

Watch Video Solution

13. match the items given in column I with the items given in column II.

	Column I		Column II
A.	Mg in solid state	1.	*p* –type semiconductor
B.	$MgCl_2$ in molten state	2.	*n* –type semiconductor
C.	Silicon with phosphorus	3.	Electrolytic conductors
D.	Germanium with boron	4.	Electronic conductors

Watch Video Solution

14. Match the type of packing given in column I with the iterms given in column II.

Column I	Column II
A. Square close packing in two dimensions	1. Triangular voids
B. Hexagonal close packing in two dimensions	2. Pattern of spheres is repeated in every fourth layer
C. Hexagonal close packing in three dimensions	3. Coordination number = 4
D. Cubic close packing in three dimensions	4. Pattern of sphere is repeated in alternate layers

Watch Video Solution

15. Assertion :- (A) The total number of atoms present in a simple cubic unit cell is one .

Reason :-(R) Simple cubic cell has atoms at its corners , each of which is shared between eight adjacent unit cells.

A. Assertion and reason both are correct statements and Reason is correct explantion for Assertion .

B. Asserton and Reason both are correct statement but Reason is not correct explanation for assertion .

C. Assertion is correct statement but reason is worng statement .

D. Assertion is Wrong statement but Reason is correct statement .

Answer: A

Watch Video Solution

16. Assertion :- (A) Graphite is good conductor of electricity however diamond belongs to the category of insulators .

Rason (R) Grapite is soft in anture on the hand diamond is very hard and brittle.

A. Assertion and reason both are correct statements and Reason is correct explantion for Assertion .

B. Asserton and Reason both are correct statement but Reason is not correct explanation for assertion .

C. Assertion is correct statement but reason is worng statement .

D. Assertion is Wrong statement but Reason is correct statement .

Answer: B

 Watch Video Solution

17. Assertion :- (A) total number of octahedral voids present in unit cell of cubic close of each packing including the one that is present at the body centre . Is four .

Reason :- (R) Besides the body centre there is

one octahedral void present at the centre of each of the six faces of the unit cell and each of which is shared between two adjeccent units cells.

A. Assertion and reason both are correct statements and Reason is correct explantion for Assertion .

B. Asserton and Reason both are correct statement but Reason is not correct explanation for assertion .

C. Assertion is correct statement but reason is worng statement .

D. Assertion is Wrong statement but Reason is correct statement .

Answer: C

Watch Video Solution

18. Assertion :- (A) the paking efficiency is maximum for the fcc struture .

Reason :- (R) the coordination number is 2 in fcc structures.

A. Assertion and reason both are correct statements and Reason is correct explantion for Assertion .

B. Asserton and Reason both are correct statement but Reason is not correct explanation for assertion .

C. Assertion is correct statement but reason is worng statement .

D. Assertion is Wrong statement but Reason is correct statement .

Answer: B

Watch Video Solution

19. Assertion :-(A) semiconductors are solids with conductivites in the intermediate range from$10^{-6} - 10^{4} ohm^{-1} m^{-1}$

Reason :-(R) internmediate conductivity in

semiconductor Is due to partially filled valence band .

A. Assertion and reason both are correct statements and Reason is correct explantion for Assertion .

B. Asserton and Reason both are correct statement but Reason is not correct explanation for assertion .

C. Assertion is correct statement but reason is worng statement .

D. Assertion is Wrong statement but Reason is correct statement .

Answer: C

Watch Video Solution

Matching The Columns

1. match the defects given in column I with the statements in given Column I.

	Column I		Column II
A.	Simple vacancy defect	1.	Shown by non-ionic solids and increases density of the solid
B.	Simple interstitial defect	2.	Shown by ionic solids and decreases density of the solid
C.	Frenkel defect	3.	Shown by non-ionic solids and density of the solid decreases
D.	Schottky defect	4.	Shown by ionic solids and density of the solid remains the same

Watch Video Solution

Long Answer Type Questions

1. With the help of a labelled diagram show that there are four octahedral voids per unit cell in cubic close packed structure .

Watch Video Solution

2. Show that in a cubic close packed structure eight tetrahedral voids are present per unit cell .

Watch Video Solution

3. How does the doping increase the conductivity of semiconductor ?

Watch Video Solution

4. The composition of a sample of wustite is $Fe_{0.93}O_{1.00}$. What percentage of iron is present in the form of $Fe(III)$?

Watch Video Solution