

**CBCS**  
**2020**  
**CHEMISTRY**  
**MODEL QUESTION PAPER FOR ODD SEMESTER EXAMINATION 2020**  
**MULTIPLE CHOICE (MCQ)**

**UNIT-I Chemical Bonding**

1. Schottky defect in crystals is observed when
  - (a) Unequal number of cations and anions are missing from the lattice
  - (b) Equal number of cations and anions are missing from the lattice**
  - (c) An ion leaves its normal site and occupies an interstitial site
  - (d) Density of the crystal is increased
2. At zero kelvin, most the ionic crystal possess
  - (a) Frenkel defect
  - (b) Schottky defect
  - (c) Metal excess defect
  - (d) No defect**
3. In stoichiometric defects, the ratio of positive and negative ions as indicated by chemical formula of the chemical:
  - (a) Decreases
  - (b) Increases
  - (c) Remains same**
  - (d) Cannot be predicted
4. In the Schottky defect
  - (a) Cations are missing from the lattice sites and occupy the interstitial sites
  - (b) Equal number of cations and anions are missing**
  - (c) Anions are missing and electrons are present in their place
  - (d) Equal number of extra cations and electrons are present in the interstitial sites
5. As a result of Schottky defect
  - (a) There is no effect on density
  - (b) Density of the crystal increases
  - (c) Density of the crystal decreases**
  - (d) Any of the above three can happen
6. Schottky defect is likely to be found in:
  - (a) AgI
  - (b) NaCl**
  - (c) ZnS
  - (d) ZnO

7. Which of the following is correct?
- (a) Schottky defect lowers the density
  - (b) Frenkel defect increases the dielectric constant of the crystal
  - (c) Stoichiometric defect makes the crystal good conductor
  - (d) All the three**
8. Frenkel defect is generally observed in
- (a) AgBr
  - (b) AgI
  - (c) ZnS
  - (d) All of these**
9. Frenkel defect is found in crystals in which the radius ratio is:
- (a) Low**
  - (b) 1:3
  - (c) 1:5
  - (d) Slightly less than unity
10. As a result of Frenkel defect,
- (a) There is no effect on density**
  - (b) There is no effect on conductivity
  - (c) There is no effect on dielectric constant
  - (d) There is no effect on all there of the above

### UNIT-II Chemical Bonding-III

1. Which of the following theory provides good explanation about the paramagnetic behaviour of oxygen?
- (a) resonance theory
  - (b) VSEPR theory
  - (c) Molecular Orbital Theory**
  - (d) Valence Bond Theory
2. Which of the following species is paramagnetic?
- (a)  $O_2$**
  - (b)  $N_2$
  - (c)  $H_2$
  - (d)  $O_2^-$
3. In which set o molecules are all the species paramagnetic
- (a)  $B_2$ ,  $O_2$ , N
  - (b)  $B_2$ ,  $O_2$ , NO**
  - (c)  $B_2$ ,  $F_2$ ,  $O_2$
  - (d)  $B_2$ ,  $O_2$ ,  $Li_2$

4. In the formation of  $N_2$  molecule according to Molecular Orbital Theory the outermost electron goes to
  - (a)  $\pi$ MO
  - (b) sp hybrid orbital
  - (c)  $\sigma$  MO**
  - (d) 2p orbital
5. In the molecular orbital diagram of for  $O_2^+$  ion the highest occupied orbital is
  - (a)  $\sigma$  MO
  - (b)  $\pi$  MO
  - (c)  $\pi^*$  MO**
  - (d)  $\sigma^*$  MO
6. The molecular orbital configuration of  $B_2$  molecule is
  - (a)  $(\sigma 1s)^2 (\sigma^* 1s)^2 (\sigma 2s)^2 (\sigma^* 2s)^2 (\pi 2p_x)^1 (\pi 2p_y)^1$**
  - (b)  $(\sigma 1s)^2 (\sigma^* 1s)^2 (\sigma 2s)^2 (\sigma^* 2s)^2 (\sigma 2p_z)^2$
  - (c)  $(\sigma 1s)^2 (\sigma^* 1s)^2 (\sigma 2s)^2 (\sigma^* 2s)^2 (\pi 2p_x)^2$
  - (d)  $(\sigma 1s)^2 (\sigma^* 1s)^2 (\sigma 2s)^2 (\sigma^* 2s)^2 (\pi 2p_x)^1 (\pi 2p_y)^1$
7. How many bonds (bond order) does  $B_2$  have?
  - (a) 0
  - (b) 1**
  - (c) 2
  - (d) 3
8. Which of the following molecular orbital has the lowest energy?
  - (a)  $\sigma 2p_z$
  - (b)  $\sigma^* 2p_z$
  - (c)  $\pi^* 2p_z$
  - (d)  $\pi^* 2p_y$
9. For a homonuclear diatomic molecule the energy of  $\sigma 2s$  orbital is
  - (a)  $> \sigma^* 2s$  orbital
  - (b)  $< \sigma^* 2s$  orbital
  - (c)  $> \sigma^* 1s$  orbital
  - (d) Both (b) and (c) are correct**
10. Which of the following statements is correct about  $N_2$  molecule?
  - (a) It has a bond order of 3
  - (b) The number of unpaired electrons present in it is zero and hence it is diamagnetic
  - (c) The order of filling of MOs is  $\pi(2p_x) = \pi(2p_y), \sigma(2p_z)$
  - (d) All the above three statements are correct**

### UNIT-III Chemistry of s and p block elements

1. Caro's acid is
  - a.  $\text{H}_2\text{SO}_4$
  - b.  $\text{H}_2\text{SO}_5$
  - c.  $\text{H}_2\text{S}_2\text{O}_6$
  - d.  $\text{H}_2\text{S}_2\text{O}_8$
2. Silicon carbide is used as
  - a. a solvent
  - b. a dehydrating agent
  - c. an abrasive
  - d. a catalyst
3. The number and type of bonds between two carbon atoms in  $\text{CaC}_2$  are:
  - a. only one  $\pi$  bond
  - b. one  $\sigma$  and half  $\pi$  bond
  - c. one  $\sigma$  and one  $\pi$  bond
  - d. one  $\sigma$  and two  $\pi$  bond
4. Electrolysis of fused  $\text{NaH}$  liberates  $\text{H}_2$  at:
  - a. anode
  - b. cathode
  - c. cathode and anode both
  - d. none of these electrodes
5. Which of the following is a pseudohalogen ?
  - a.  $\text{IF}_7$
  - b.  $\text{ICl}_2$
  - c.  $(\text{CN})_2$
  - d.  $\text{I}_3$
6. Which of the following is not a pseudohalide ion?
  - a.  $\text{CNO}^-$
  - b.  $\text{CN}^-$
  - c.  $\text{SCN}^-$
  - d.  $\text{S}^{2-}$
7. Which of the following shows inert pair effect
  - a. Boron
  - b. Carbon
  - c. Silicon
  - d. Tin

8. Calciumcarbide( $\text{CaC}_2$ ), when decomposed by water, produces:

- a. methane
- b. ethane
- c. ethane
- d. ethyne

9. Which of the following carbide ion Is called methanide?

- a.  $\text{C}^{4-}$
- b.  $\text{C}_2^{2-}$
- c.  $(\text{c})\text{C}_3^{4-}$
- d.  $\text{C}^{4+}$

10. Example of covalent carbides are

- a.  $\text{CaC}_2$  and  $\text{CH}_4$
- b.  $\text{B}_4\text{C}$  and  $\text{Al}_4\text{C}_3$
- c.  $\text{Al}_4\text{C}_3$  and  $\text{Ag}_2\text{C}_2$
- d.  $\text{SiC}$  and  $\text{B}_4\text{C}$
- e.

#### UNIT-IV

1. the symmetry point group of  $\text{BF}_3$  is :

- a.  $D_{2d}$
- b.  $D_{3h}$
- c.  $D_{2h}$
- d.  $C_{2v}$

2. which of the following can act both as Bronsted acid and Bronsted base?

- a.  $\text{Na}_2\text{CO}_3$
- b.  $\text{OH}^-$
- c.  $\text{HCO}_3^-$
- d.  $\text{NH}_3$

3.  $\text{NH}_4^+$  is

- a. a conjugate acid
- b. a conjugate base
- c. neither an acid nor a base
- d. both an acid and a base

4. a compound having the formula ,  $\text{NH}_2 - \text{CH}_2 - \text{COOH}$  may behave :

- a. only as an acid
- b. only as a base
- c. both as an acid nd a base
- d. (d)neither as an acid nor a base

5. The strongest conjugate base is

- (a)  $\text{NO}_3^-$
- (b)  $\text{Cl}^-$
- (c)  $\text{SO}_4^{2-}$
- (d)  $\text{CH}_3\text{COO}^-$

6. Which of the following is not a protonic solvent

- (a)  $\text{NH}_3$
- (b)  $\text{HCOOH}$
- (c)  $\text{C}_6\text{H}_6$
- (d)  $\text{HF}$

7. which of the following is not a product of auto ionisation of liq.  $\text{NH}_3$

- (a)  $\text{N}^{3-}$
- (b)  $\text{NH}^{2-}$
- (c)  $\text{NH}_2^-$
- (d)  $\text{N}_2$

8. in which of the following reactions liq.  $\text{NH}_3$  itself acts as a reducing agent?

- (a)  $2\text{NH}_3 + 3\text{CuO} \rightarrow \text{N}_2 + 3\text{Cu} + 3\text{H}_2\text{O}$
- (b)  $\text{S} + 2\text{Na} \rightarrow \text{Na}_2\text{S}$  (in liq  $\text{NH}_3$ )
- (c)  $2\text{K} + \text{NH}_3 + \text{N}_2\text{O} \rightarrow \text{KNH}_2 + \text{KOH} + \text{N}_2$
- (d) None of the above

9. Which of the following belongs to the  $\text{C}_{3v}$  point group?

- (a)  $\text{SO}_3$
- (b)  $\text{BBr}_3$
- (c)  $\text{NH}_3$
- (d)  $\text{AlCl}_3$

10. Which of the following does not contain a  $\text{C}_3$  axis?

- (a)  $\text{POCl}_3$
- (b)  $[\text{NH}_4]^+$
- (c)  $\text{H}_3\text{O}^+$
- (d)  $\text{ClF}_3$

## UNIT-V

1. The coordination number of the transition element in  $[\text{Pt Cl NO}_2 (\text{NH}_3)_4]^{2-}$  is

- (a) 2
- (b) 6
- (c) 4
- (d) 8

2. For  $K_2[(Cu(CN)_4)]$  which one is correct
- (a) Potassium tetra cyano recuparate
  - (b) Co-ordination number is 2
  - (c) The ligand is positively charged
  - (d) Central atom is present in the anionic sphere
3. The location of transition elements is in between
- (a) lanthanides & actinides
  - (b) S and P block elements
  - (c) Chalcogens and halogens
  - (d) D and F block elements
4. Compounds attracted by applied strong magnetic field are called
- (a) Diamagnetic
  - (b) Paramagnetic
  - (c) Good conductor
  - (d) Ferromagnetic
5. The correct electronic configuration of Cr is
- (a)  $[Ar]4s^23d^4$
  - (b)  $[Ar] 4s^23d^4$
  - (c)  $[Ar]4s^03d^5$
  - (d)  $[Ar]4s^13d^5$
6. The number of dative bonds to the central metal ion is its
- (a) oxidation number
  - (b) compound number
  - (c) coordination number
  - (d) Dative number
7. **The** oxidation state of transition elements is usually
- (a) Variable
  - (b) Constant
  - (c) Single
  - (d) Infinite
8. Non-stoichiometric compounds of transition elements are called
- (a) Hydrates
  - (b) Hydrides
  - (c) Binary compounds
  - (d) Interstitial compounds
9. Which of the following can form a chelate
- (a) Ammine
  - (b) Oxalate
  - (c) Carbonyl
  - (d) Cyano

**10.** The central atom along with ligands is called

- (a) Complex ion
- (b) Coordination sphere
- (c) Ligand
- (d) Complex compound

**11.** In coordination chemistry, the donor atom of a ligand is

- (a) a Lewis acid.
- (b) the counter ion
- (c) the central metal atom.
- (d) the atom in the ligand that shares an electron pair with the metal.

Mizoram University Model Question Odd Semester 2020