

B.Sc. Part III
Physical Chemistry

Multiple Choice Questions

1. What is stabilization energy of H_2^+ ion
(a) $-B$ (b) $-2B$ (c) $-3B$ (d) $-4B$
2. What is Bond Order of B_2 Molecule (MOT)
(a) 2 (b) 1.5 (c) 1 (d) 2.5
3. Magnetic nature of C_2 molecule
(a) Diamagnetic (c) Ferromagnetic
(b) Paramagnetic (d) None
4. Magnetic nature of H_2^+ ion
(a) Diamagnetic (b) Paramagnetic
(c) Ferromagnetic (d) None
5. In which spectroscopy EMR are not used
(a) Mass (b) UV (c) Infra (d) All
6. UV spectroscopy is working on which principal
(a) Absorption (b) Reflection (c) Adsorption (d) None
7. Property of ideal solution is
(a) $\Delta H = 0$ (b) $\Delta V = 0$
(b) Obey Raoult's law (d) All
8. Example of colligative property
(a) Boiling point (b) Vapour pressure
(c) Osmosis (d) All
9. Weight – volume method of concentration is
(a) M (b) N (c) F (d) All
10. Unit of Dipole moment
(a) Debye (b) Volt (c) Ampere (d) None

Short Answer Questions

1. What do you mean by Bond order –
2. _____by Hybridization
3. What is full form of LCAO
4. Write threshold energy (Defination)
5. Write formula for Compton shift
6. Define Einstein
7. What is Intersystem Crossing (ISC)
8. What is fluorescence
9. What is specific rotation
10. Explain the term instantaneous rate
11. What is specific reaction rate
12. What is temperature coefficient?
13. Write short note on activation energy
14. Write notes on Van't Hoff factor
15. Write notes on Osmosis and diffusion

Long Answer Questions

1. With the help of a diagram explain the Landsberger's method of determination of elevation in boiling point.
2. Explain the Van't Hoff factor. Show how the degree of dissociation and association of a solute can be determined from Vant Hoff's factor.
3. Discuss briefly the transition state theory of reaction rates.

4. Show that the probability factor in collision theory is controlled by the activation entropy of the reaction
5. Draw Jablonski Diagram and explain different terms used in it.
6. What are electromagnetic radiations ? Explain the different features and parts of a spectrometer.
7. Describe VBT for H_2 molecule. Compare VBT and MO theories.
8. What are operators? Derive Schrodinger's wave equation.
9. Calculate the eigen values and eigen functions for a particle in one dimensional box.
10. Derive Clausius-Mossotti equation and explain types of polarizability.