

University of Mumbai

National Centre for Nanosciences and Nanotechnology

M.Sc. Sem I Examination

Paper II: Essential Chemistry

1. At 25 °C, Concentration of pure Water is.....

1. 1.0 M
2. 18.0 M
3. 55.5 M
4. 0.0 M

2. Among the following, the process that exothermic is:

1. Fusion
2. Sublimation
3. Evaporation
4. Condensation

3. The hybridization of BH₃ Molecule is:

1. sp
2. sp²
3. sp³
4. sp³d

4. Which of the following species the bond order is 3 ?

1. CN
2. BN
3. NO
4. CN⁻

5. A catalyst increases the rate of a reaction by:

1. Decreasing the activation energy
2. Increasing the activation energy
3. Making the reaction endothermic
4. Making the reaction exothermic

6. In which of the following bonds does H carry δ^{-ve} charge?

1. F-H
2. O-H
3. B-H
4. N-H

7. Based on the first law of thermodynamics, which one of the following is correct?

1. For an isothermal process, $q = +w$
2. For an isochoric process, $\Delta U = -q$
3. For an adiabatic process, $\Delta U = -w$
4. For a cyclic process, $q = -w$

8. Carbon-14 dating method was developed by

1. Leona Woods
2. Ernest Lawrence
3. Willard Libby
4. James R. Arnold

9. Which of the following characteristics is not possessed by an ideal solution:

1. Obeys Raoult's law.
2. Volume change on mixing is not equal to zero.
3. There should be no chemical reaction between solute and solvent.
4. Only very dilute solutions behave as ideal solutions.

10. When a solute is dissolved in water it shows:

1. Decrease in freezing point of water.
2. Decrease in boiling point of water.
3. Increase in vapour pressure of water.
4. All of the above.