B.Sc. Part II
Physical Chemistry

Multiple Choice

Q.1   The unit of temperature (S.I.) is

(a) Celsius   (b) Centigrade   (c) Kelvin   (d) Fahrenheit

Q.2   The unit of mass (S.I.) is

(a) kg   (b) gm   (c) tonne   (d) newton

Q.3   Kinetic energy of the molecules in terms of absolute temp (T) is proportional to

(a) T   (b) J   (c) J/2   (d) 1/Vr

Q.4   No liquid can exist as liquid at

(a) $-273k$ (b) Zero pressure   (c) Vacuum   (d) in space

Q.5   Gas constant is equal to

(a) Cp-Cv   (b) Cv-Cp   (c) Cp + Cv   (d) CpCv

Q.6   The potential of a hydrogen electrode at pH = 10 is

(a) 0.5 qV   (b) $-0.5qV$ (c) 0.00V   (d) $-0.059V$

Q.7   Which of the solution has the least specific conductance

(a) 0.2N   (b) 0.02N   (c) 2N   (d) 0.002N

Q.8   Gibbs phase rule

(a) P + F = C + 1   (b) P + F = C + 2

(c) P + F = C -1   (d) P+F = C–2

Q.9   Eutectic product in Fe-C system is called

(a) Pearlite   (b) Ledeburite

(c) Bainite   (d) Spheroidite

Q.10 Wt of carbon in mild steels

(a) < 0.008 (b) 0.3-0.8

(c) 0.008-0.3   (d) 0.8-2.11

Short Questions

1. Define Hess's law.

2. Explain work of expansion

3. Define enthalpy.

4. Explain third law of thermodynamics.

5. What is meant by Gibbs energy?

6. Define the heat reservoir.

7. What is reduced phase rule equation?

8. What is eutectic mixture?

9. Define distribution law.

10. Define ideal solution.

11. What is transport number?

12. Explain Faraday's law of electrolysis.

13. What is ionic mobility?

14. What is meant by half cell potential?

15. What are fuel cell?

Long Answer Questions

1. What is Joule's law? Describe Joule's experiment for the measure of $\left(\dfrac{\partial E}{\partial V}\right)_T$ for real gases.

2. What do you mean by heat of reaction? Discuss the effect of temp. on the heat of reaction and derive Kirchoff's equation.

3. Write Clacius Clapyron Equation. Discuss in detail its applications.

4. Derive expression for K_P of the reaction.

$$2SO_2 + O_2 \rightleftharpoons 2SO_3$$
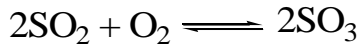
5. Draw phase diagram of lead silver system and explain its essential features.

6. Write Nernst's distribution law. Explain its limitations in short.

7. Discuss liquid junction potential with and without transference taking suitable example.

8. Write notes on

   (a) Concentration cell.

   (b) Potentiometric titration.

9. Discuss the Debye-Huckel theory of strong electrolytes.

10. Describe Hittorf method for the determination of transport number of Cu^{+2}.