BSC. PART - II EXAMINATION - 2018

CHEMISTRY HONOURS PHYSICAL

1. Select the most appropriate answer among the four alternative given :

(a) If the free energy change $\Delta G = 0$:

(i) The process is reversible (ii) The system is adiabatic

(iii) The system is in equilibrium (iv) The system is isobaric

(b) The electrical conductivity of an electrolyte depend upon :

(i) The number of ions present in the electrolyte

(ii) The number of molecules in the electrolyte

(iii) The number of ions present in the solution

(iv) The number of molecules of the solvent

(c) The phase rule was first discovered by :

(i) Nernst (ii) Gibbs (iii) Arrhenius (iv) Ostwald

(d) With rise in temperature, the surface tension of a liquid :

(i) Decreases (ii) Increases (iii) Remains the same (iv) None of these

(e) Association of molecules of water is due to :

(i) Surface tension (ii) Viscosity (iii) Optical activity (iv) Hydrogen bonding

(f) When a strong acid is titrated against a strong base the end point is the point of:

(i) Zero conductance (ii) Maximum Conductance

(iii) Minimum conductance (iv) None of these

(g) The system with zero degree of freedom is known as :

(i) Bivariant (ii) Polyvariant (iii) Monovariant (iv) Invariant

(h) For an ideal gas Joul-Thomson co-efficient is :

(i) Zero (ii) Psitivie (iii) Negative (iv) Depend on molecular weight

(i) During the formation of CO_2 from CO and O_2 enthalpy of the system :

(i) Increases (ii) Descreases (iii) Becomes Zero (iv) Remain constant

(j) Which is an extensive property ?

(i) Boiling point (ii) Density (iii) Heat (iv) Specific heat

2. (a) For a closed system derive Gibbs-Helmholtz equation in terms of ΔG and ΔH.

(b) Discuss its applications.

3. (a) Describe carnot cycle. Derive expression for its efficiency.

(b) Calculate the amount of heat supplied to carnot cycle working between 368 K and 288 K and maximum work obtained is 800J.

4. (a) Explain the term specific conductivity and equivalent conductivity.

(b) Discuss the effect of dilution on specific and equivalent conductivity.

(c) Find the equivalent conductivity of N/10 KCl solution having a specific conductivity of 0.01119 mhos cm^{-1}.

http://www.tmbuonline.com

5. (a) Explain Kohlrausch's law of independent migration of ions.
   (b) What are SI units of specific conductivity, equivalent conductivity and molar conductivity.
   (c) The ionic conductance A^+ and B^- ions are 63.4 and 83.6 respectively. Calculate their ionic mobilities.
6. What are liquid crystals ? How are they classified ? Describe the main features and structure of (a) Nematic (b) Smectic and (c) Cholesteric liquid crystals.
7. (a) Explain Nernst's heat theorem How does it lead to the enunciation of the 3rd law of thermodynamics ?
   (b) What are the limitations of 3rd law of thermodynamics ?
8. (a) Explain phase diagram of Ag-Pb System. (b) Describe desilverisation of lead.
9. Write short notes on any two of the following :
   (i) Cell Constant (ii) Conductomeric titration
   (iii) Thermodynamic scale of temperature (iv) Isothermal and Adiabatic change.