

## LNMUonline.com Chemistry (Hons.) Paper-III

Answer five questions, selecting at least one from each Group, in which Q.No. 1 is compulsory.

1. Give reasons :

- (a) PV-adiabatic is more steeper than PV-isotherm.
- (b) Heat of neutralisation of weak acid and weak alkali is less than that of strong acid and strong alkali.
- (c)  $dq$  and  $dw$  are not perfect differentials.
- (d) Eutectic point for binary eutectic system is invariant.
- (e) C-O bond is polar but  $CO_2$  is non-polar.

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### Group-A

- 2. (a) State Gibbs-Helmholtz equation and its applications.  
(b) Explain isothermal and adiabatic processes.
- 3. (a) Calculate maximum work done in reversible isothermal expansion of one mole of ideal gas.  
(b) Define Joule-Thomson coefficient.
- 4. (a) State and explain Nernst's distribution law.  
(b) Discuss the application of law in case of association of solute in one of the solvents.
- 5. Write notes on any two of the following :  
(a) Reduced phase rule equations and terms involved  
(b) Eutectic systems (c) Carnot's theorem
- 6. Give primary valency, secondary valency, C.N. and geometry of the following :  
(a)  $Cu(en)_3^{++}$  (b)  $K_4[Fe(CN)_6]$  (c)  $Na_3Fe(C_2O_4)_3$
- 7. Draw MO diagram of  $O_2$  and compare bond order, bond energy and magnetic behaviour of  $O_2$ ,  $O_2^-$  and  $O_2^{++}$
- 8. Discuss the chemistry of Ni or Mn with respect to the following :  
(a) Position in PT (b) Occurrence and extraction  
(c) Important oxidation states  
(d) Preparation and properties of important compounds
- 9. Give preparation, properties and structure of any two of the following :  
(a) Thionic acids (b) Sodium Thiosulphate (c) HF
- 10. Give the IUPAC names of the following :  
(a)  $[Co(NH_3)_5Br]Cl_2$  (b)  $[Pd(NH_3)_4][PdCl_4]$   
(c)  $Ni(dmg)_2$  (d)  $K_2[Cu(C_2O_4)_2] \cdot 2H_2O$  (e)  $K_2[Cr(NH_3)_4(H_2O)Cl]$

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