

Roll No.

(04/17-1)

5213

B. Sc. EXAMINATION

(Fourth Semester)

CHEMISTRY

CH-205

Physical Chemistry

Time : Three Hours

Maximum Marks : 26

Note : Q. No. 1 is compulsory. Attempt two questions from each Section A and B.

1. (i) If T_1 is 90% of T_2 , then what is efficiency of engine ?
- (ii) What is a cyclic process ?
- (iii) What is the criterion of spontaneity in terms of Entropy change ?
- (iv) Define electrode potential.

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P.T.O.

(v) What do you understand by the term Concentration Cell ?

(vi) Why is voltmeter not suitable to measure EMF of a cell ? 1×6=6

Section A

2. (a) Derive an expression for Entropy change of a ideal gas associated with change in temperature and pressure simultaneously.

(b) Write a short note on Residual entropy with example. 3+2

3. (a) Derive the expression :

$$\Delta G = \Delta H + T \left(\frac{\partial G}{\partial T} \right)_P$$
 By what name this relation is called ? 2+2=4

(b) Derive a relation for the criterion of spontaneity in terms of Work Function.

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4. (a) What do you understand by Nernst Heat Theorem ? Does it apply to all three states Solid, Liquid and Gas equally ?
- (b) Derive the thermodynamic expression :

$$P = - \left(\frac{\partial A}{\partial V} \right)_T \quad 3+2$$

Section B

5. (a) What are the various types of reversible electrodes ? Discuss the construction and working of Hydrogen and Chlorine electrodes in detail.
- (b) Deduce the relation : 3+2

$$\Delta S = nF \left(\frac{\partial E}{\partial T} \right)_p$$

6. (a) What is electrochemical series ? Discuss its applications.
- (b) Write a short note on Electrode concentration cell without transference.
- 3+2

7. (a) Discuss, how you will measure pH of a solution using a Glass electrode.
- (b) Derive Nernst equation for measurement of emf of a cell. 3+2