9. (a) For the reaction, $CO + \frac{1}{2}O_2 \rightarrow CO_2$

$\Delta H = -6750$ cal at 25° C calculate

ΔH of the reaction at 100° C given

Cp (CO) = 6.97, Cp (CO_2) = 8.97, and Cp (O_2) = 7.0, in cal mol^{-1} k^{-1}.　　　　　　　2

(b) Explain various application of Hess's law of heat summation.　　　　4

(c) Write factors on which enthalpy of reaction depends ?

Roll No. ....

91534

B. Sc. 2nd Semester Chemistry (Hons.)
(New Scheme)
Examination – May, 2016

PHYSICAL CHEMISTRY

Paper : 202

Time : Three Hours]	[Maximum Marks : 40

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all. Question No. 1 is *compulsory*. Selecting *two* questions from each Section I & II. All questions carry equal marks.

1. (a) Write unit of the rate constant for $3/2$ order.　1×8

　　(b) Define average life period.

　　(c) Define migration of ions.

　　(d) Define equivalent conductance.

(e) What do you understand by Hittorf's number?

(f) What is meant by asymmetric effect?

(g) Define Non-spontaneous process.

(h) Define standard entropy.

SECTION – I

2. (a) Distinction between order and molecularity of a reaction.   4

(b) Explain Isolation method for deformination of order of reaction.   4

3. (a) The half-life of the homogenous gaseous reaction

$$SO_2Cl_2 \rightarrow SO_2 + Cl_2.$$

Which obeys first order kinetics, is 80 minute? How long will it take for the concentration of SO_2Cl_2 to be reduced to 1% of initial value?   3

(b) Explain differential method for determination of order of reaction.   5

4. (a) Explain Ostwald's Dilution Law and its Limitation.   5

(b) Calculate the conductance resistance of 0.1 M $NaCl$ solution whose specific conductivity is 0.01 ohm^{-1} cm^{-1} and cell constant is 0.1 cm^{-1}.   3

5. (a) Explain the relation between specific conductance and equivalent conductance.   3

(b) The resistance of 0.5 M solution of an electrolyte in a cell was found to be 45 Ω. Calculate molar conductance of the solution. If the electrodes in the cell are 2.2 cm apart and have an area of 3.8 cm^2.   3

(c) Why conductance of weak electrolyte cannot be determined even after infinite dilution?   2

SECTION – II

6. (a) Explain moving boundary method for determination of transport number.   4

(b) Explain conductometric titration with application.   4

7. (a) Describe Debye-Hackel Onsagar equation with its limitation.   6

(b) Define electrophoretic effect.   2

8. (a) How does change in Entropy along with a change in internal energy of the system and surrounding helps us to decide whether a process is reversible or irreversible?   3

(b) Show that work involved in an adiabatic expansion is less than in isothermal process.   2

(c) What is the significance to consider the change in free energy at constant temperature and pressure?   3