Day :	**Tuesday**		Time : **03.00 PM TO 06.00 PM**
Date :	**17/04/2018**	**S-2018-0649**	Max. Marks :60

N. B. :
1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Use of scientific calculator is **ALLOWED**.
4) Answers to the both sections should be written in the **SAME** answer book.

SECTION – I (Physical Chemistry)

Q.1   Attempt any **TWO** of the following   **(12)**
a) Explain the terms conductance and specific resistance.
b) Give different statements of second law of thermodynamics.
c) Entropy is a measure of order and disorder of a system. Explain.

Q.2   Attempt any **THREE** of the following   **(12)**
a) In a conductance cell, the two electrodes are 1.6 cm apart and have an area of cross – section 3.2 cm^2. Find cell constant.
b) Calculate the percentage efficiency of a steam engine operating between 383 K and 298 K.
c) What will be the change in entropy of 2 moles of an ideal gas when it is heated from a volume of 80 dm^3 at 323 K to a volume of 120 dm^3 at 423 K?
   ($R = 8.314 \text{J}$; $C_v = 32.97 \text{ JK}^{-1} \text{ mol}^{-1}$)
d) What are the advantages of conductometric titrations?

Q.3 **A)**   Attempt any **ONE** of the following   **(06)**
a) Derive the expression for entropy change in an isothermal reversible process in an isolated system.
b) Explain variation of conductance with concentration.

SECTION – II (Analytical Chemistry)

Q.3 **B)**   Attempt any **ONE** of the following   **(06)**
a) Explain phosphate removal scheme & borate removal scheme in quantitative analysis.
b) What are the different methods used to minimize different types of errors?

Q.4   Attempt any **TWO** of the following   **(12)**
a) Explain the scheme of classification of cations into groups.
b) What is the basis of sampling? Explain sampling of solid & sampling of liquid in brief.
c) Describe Kjeldhal's method of estimation of nitrogen in an organic compound.

Q.5   Attempt any **FOUR** of the following   **(12)**
a) Explain Lassaigene's sodium Fusion test.
b) Define:
   (i) Accuracy   (ii) Precision   (iii) Relative error.
c) Calculate the proper number of significance figures in each of the following:
   (i) 0.0085   (ii) 8.680   (iii) 3.0050
d) For the following set of results, calculate deviation & mean deviation
   (i) 25.10   (ii) 25.20   (iii) 25.00
e) Perform the addition and subtraction operations & express the results in proper number of significant figures
   (i) $6.731 + 0.6731 + 5.0$ (ii) $46.6312 - 46.5899$
f) Give the methods of preparation of solution for inorganic qualitative analysis.

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