S.Y.B.SC. SEM – III (CBCS - 2016 Course) : SUMMER - 2019
SUBJECT: CHEMISTRY: PHYSICAL & ANALYTICAL CHEMISTRY-I

Day: Saturday
Date: 13/04/2019

Time: 03.00 P.M. To 06.00 P.M
Max. Marks: 60

S-2019-0828

N.B:

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Used 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) Describe different types of conductivity cells.
b) Explain the spontaneous and non- spontaneous processes.
c) 'Entropy is a measure of order and disorder' Explain.

Q.2 Attempt any **THREE** of the following: **(12)**

a) Discuss the concept of transport number.
b) Calculate the percentage efficiency of a steam engine operating between 483K and 398K.
c) In a conductance cell, the two electrodes are 1.6 cm apart and have an area of cross section 3.2 cm^2. Find the cell constant.
d) Calculate the entropy change involved in the isothermal reversible expansion of 5 moles of an ideal gas from a volume of $5dm^3$ to a volume of 50 dm^3 at 300K. ($R=8.314\ Jmol^{-1}$)

Q.3 A) Attempt any **ONE** of the following: **(06)**

a) Discuss the conductometric titration of weak acid and weak base.
b) What are the inadequacies of the first law of thermodynamics? Give different statements of second law of thermodynamics.

SECTION-II (Analytical Chemistry)

Q.3 B) Attempt any **ONE** of the following: **(06)**

a) Define: i)Error ii) Absolute error iii) Relative error iv)Accuracy v)Precision vi)Deviation
b) Describe Kjeldhal's method of estimation of nitrogen in an organic compound.

Q.4 Attempt any **TWO** of the following: **(12)**

a) When and how does phosphate ion interfere in qualitative analysis? Discuss the methods used for the removal of this ion.
b) How will you classify errors? Give examples.
c) Write a note on 'Lassaigne's sodium fusion test'.

Q.5 Attempt any **FOUR** of the following: **(12)**

a) What is a Gross Sample? Sample? Grab Sample?
b) Explain the use of NaOH in qualitative analysis.
c) Discuss the effect of NH_4OH in presence of NH_4Cl in qualitative analysis.
d) Calculate the proper number of significant figures in each of the following:
i)85.300 ii)3.8590 iii)0.0020
e) If 4.65 gm sample of material is reported as 4.70 gm, find absolute and relative errors.
f) Perform the required operations and express the results in proper number of significant figures.
i)54.2 + 5.42 + 3.88 ii) 25.00 + 4.365 + 1.23

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