S.Y.B.SC. SEM – III (2014 COURSE) : SUMMER - 2018
SUBJECT : CHEMISTRY: PHYSICAL AND ANALYTICAL CHEMISTRY-III

Day : **Thursday**
Date : **19/04/2018**

S-2018-0710

Time : **12.00 NOON TO 02.00 PM**
Max. Marks: 40.

N.B.:

1) All questions are **COMPULSORY.**
2) Figures to the **RIGHT** indicate full marks.
3) Use of Scientific calculator/ Log table is **ALLOWED.**
4) Draw and neat labeled diagrams **WHEREVER** necessary.
5) Both the sections should be written in the **SAME** answer book.

SECTION-I (Physical Chemistry)

Q.1 Attempt any **TWO** of the following: **(10)**

a) Explain the term cell constant.
b) Obtain the expression for efficiency of Carnot's cycle.
c) What is entropy? Give its units. Whether it is a state or non-state function?

Q.2 Attempt any **ONE** of the following: **(05)**

a) What do you understand by transport number?
b) Explain change in specific and equivalent conductances with concentration.

Q.3 Attempt any **TWO** of the following: **(05)**

a) Heat supplied to a Carnot engine is 1897.86 kJ. How much useful work can be done by the engine which works between 383k and 298k?
b) The equivalent conductivity of an acid of a dilution of 64 dm^3 is 11.6 Sm^2 and $\wedge_\infty$ is 380 Sm^2. Find degree of dissociation of acid.
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.

SECTION-II (Analytical Chemistry)

Q.4 Attempt any **TWO** of the following: **(10)**

a) Explain steam distillation method.
b) Define sampling. Explain the process and its significance.
c) What do you mean by 'Significant figures'? Explain it with suitable examples.

Q.5 Attempt any **ONE** of the following: **(05)**

a) Define empirical formula and molecular formula. What is the relationship between empirical and molecular formula?
b) Explain Lewis theory of acids and bases.

Q.6 Attempt any **TWO** of the following: **(05)**

a) Calculate deviation and mean deviation of the following replicate set of data.
50.5, 50.9, 51.2
b) How many significant figures does each of the following numbers have?
i) 0.0100 ii) 1.0089 iii) 2.0503 iv) 8.0001 v) 9.256.
c) The results of an analysis are found to give 96.89% of metal compared to the true value of 96.95. What is the relative error in parts per thousand?

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