T.Y.B.SC. SEM – V (CBCS - 2016 Course) : SUMMER - 2019
SUBJECT: CHEMISTRY PHYSICAL CHEMISTRY – I

Day: Wednesday
Date: 10/04/2019

Time: 11.00 A.M. To 02.00 P.M.
Max. Marks: 60

S-2019-0858

N.B.:

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Use of log table / scientific **CALCULATOR** allowed.
4) Draw neat diagrams **WHEREVER** necessary.

Q.1 Attempt any **TWO** of the following: **(12)**

a) Discuss the simple colorimeter and photoelectric colorimeter.
b) What is the Galvanic cell? Describe Daniell cell.
c) Define the term adsorption. Distinguish between adsorption and absorption.

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

a) State the derive Lambert's law.
b) Draw neat diagrams of physical adsorption isotherms.
c) What is adsorption isotherm? Explain in brief Freundlich adsorption isotherm.

Q.3 Attempt any **TWO** of the following: **(12)**

a) What are the IUPAC conventions used to represent a cell?
b) Derive Nernst equation for emf of the cell.
c) What are causes of deviations from the Beer's law?

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

a) Calculate the electrode potential of the following electrode at 298 K.
$Zn^{2+}_{(aq)}, 0.1M \mid Zn_{(s)}, \quad E^0_{zn} = -0.761\ V$

b) Calculate the emf of the chemical cell without transference.
$Pt \mid H_{2(g,1atm)} \mid HCl(a=1) \mid Hg_2Cl_{2(s)} \mid Hg_{(l)} \mid Pt$
Standard potential of calomel electrode is 0.268 V at 298 K.

c) The molar absorptivity of a particular solute is 2.1×10^4. Calculate the transmittance through a cuvette with a light path of 5 cm for a $2.0\times10^{-6}\ M$ solution.

d) A solution of vitamin D_2 shows 80% transmittance at wavelength 264nm. Express the measurement in terms of absorbance units.

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

a) Describe the concept of black body radiation.
b) Give a brief account of photoelectric effect.
c) Give the nature and significance of wave function.
d) What do you mean by physical and chemical adsorptions?
e) Explain hydrogen gas electrode.
f) Write a short note on quantum theory of radiation.

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