

T.Y.B.SC. SEM – V (2014 COURSE) : WINTER- 2017

SUBJECT : PHYSICAL CHEMISTRY – V

Day : Monday
Date : 23/10/2017

W-2017-0643

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) Answers to both the sections should be written in **SAME** answer book.
- 4) Use of non-programmable scientific calculator is **ALLOWED**.

SECTION - I

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

- a) Explain working of Daniell cell with reference to construction, electrode reactions and overall cell reaction.
- b) Define the following terms:
 - i) Transmittance
 - ii) Opacity
 - iii) Optical density
- c) Discuss reversible cell with suitable example.

Q. 2 Attempt **ANY TWO** of the following: (10)

- a) Discuss in brief quantum theory of radiation.
- b) What is an adsorption isotherm? Give assumptions of Langmuir adsorption isotherm.
- c) Describe determination of pH by emf measurement.

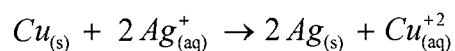
SECTION – II

Q. 3 Attempt **ANY TWO** of the following: (10)

- a) Derive, $\Delta S = nF \left(\frac{dE}{dT} \right)_p$.
- b) What is adsorption? Distinguish between physical and chemical adsorptions.
- c) Give detail an account of metal-insoluble salt electrode.

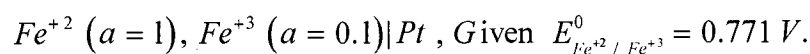
Q. 4 Attempt **ANY TWO** of the following: (10)

- a) Calculate equilibrium constant for the reaction:



$$E_c^0 = 0.46 V; \frac{2.303 RT}{F} = 0.059 V$$

- b) 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 $2.0 \times 10^{-6} M$ Solution.
- c) Determine the electrode potential of the following electrode at 298 K.



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