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**B.TECH.** 

# THEORY EXAMINATION (SEM-IV) 2016-17

# PHYSICAL CHEMISTRY OF DYEING

# Time : 3 Hours

Max. Marks : 100

Note : Be precise in your answer. In case of numerical problem assume data wherever not provided.

### **SECTION-A**

## 1 Explain the following: (10×2=20)

- a) What do you mean by substantively in terms of dyeing?
- b) Define the term affinity in dye fibre system.
- c) What do you mean by EDL and diffuse layer?
- d) What do you mean by zeta potential?
- e) Write down the names of types of isotherm.
- f) What is lamberts law?
- g) What is beers law?
- h) What do you mean by chemical potential
- i) What is entropy of dyeing and its units?
- j) How many types of isotherm applicable in dyeing?

## **SECTION-B**

#### 2 Attempt any five of the following: (10×5=50)

- a) What do you understand by absorption? Discuss the law related to light absorption. How wavelength affects the absorption?
- b) How instrumental errors and changes in solution show the significance of Beers law?
- c) How does the structure of cellulosic fibers and protein fibers affect the dyeing process? Support your view with suitable examples.
- d) In which form the results of equilibrium dyeing measurement are usually expressed? Explain the equation resulting the measuring of equilibrium of dyeing.
- e) Discuss the electrical effects in dyeing equilibrium.
- f) What is chemical potential? How it is responsible in dyeing of textile fibers with dyes?
- g) Give the methods of measuring diffusion coefficient in the fiber.
- h) What is the effect of temperature on rate of dyeing?

# SECTION-C

#### Attempt any two of the following: (15×2=30)

- 3 Describe the thermodynamic quantities of dyeing process. Also describe the entropy of dyeing.
- 4 Discuss dyeing rate and its limitations. Also discuss the dyeing rate under conditions of equal affinity.
- 5 With the help of pore model and free volume model explain the theories of dyeing.