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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.

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