

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VIII • EXAMINATION – SUMMER • 2015****Subject Code: 182801****Date:15/05/2015****Subject Name: Technology of Dyeing - III****Time:10.30AM-01.00PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Derive an expression of Fick's second law of diffusion. **07**
 (b) Enlist different types of bond formation between dye and fibre. **07**
 Discuss Van der Waal's forces in detail.
- Q.2** (a) Give a critical review on dyeing of acrylic fibres with basic dyes. **07**
 (b) Discuss the concept of chemical potential and free energy. Explain the **07**
 derivation of equation for measuring heats of dyeing.
- OR**
- (b) Discuss the dyeing of wool with acid dyes. **07**
- Q.3** (a) Discuss the concept of compatibility of dyes with suitable examples. **05**
 (b) Effect of substrate on direct dyeing of cellulose. **04**
 (c) Explain: Activation energy of diffusion. **05**
- OR**
- Q.3** Describe various thermodynamic aspects of reactive dyeing of cotton. **14**
- Q.4** (a) Discuss in detail the thermodynamic aspects of vat dyeing **07**
 (b) Explain the importance of soaping of vat dyes. **07**
- OR**
- Q.4** Discuss "Electrical phenomenon in dyeing". Explain, with proper **14**
 illustration, how the distribution of ionic species can be studied using the
 concept of "Donnan membrane equilibrium".
- Q.5** (a) Explain the most commonly accepted theory of nylon dyeing. **07**
 (b) Describe variations in acid dyeing adsorption on wool pH of dye bath and **07**
 maximum dye combining power of wool.
- OR**
- Q.5** (a) Explain, with examples, the applicability of Freundlich and Langmuir **10**
 isotherms in study of dyeing system.
 (b) Explain the concept of Entropy of dyeing. **04**
