**Seat No.: _____** **Enrolment No._____**

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER–VIII (NEW) - EXAMINATION – SUMMER 2017**

**Subject Code: 2182801** **Date: 29/04/2017**

**Subject Name: Technology of Dyeing - III**

**Time: 10:30 AM to 01:00 PM** **Total Marks: 70**

**Instructions:**

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

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|---|---|---|---|
| **Q.1** | **(a)** | Explain the Freundlich isotherm in detail. | **07** |
| | **(b)** | Explain the term approximate diffusion coefficient, its determination and significance. | **07** |
| **Q.2** | **(a)** | Explain the interaction of different acid dyes with suitable substrate. | **07** |
| | **(b)** | Derive an expression of Fick's second law of diffusion. | **07** |
| | | **OR** | |
| | **(b)** | Derive an expression of Fick's first law of diffusion. | **07** |
| **Q.3** | **(a)** | Give a brief account on different types of Van der Waals' forces. | **07** |
| | **(b)** | Discuss the concept of chemical potential and free energy. Explain a derivation of equation for measuring heats of dyeing. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Discuss the Peters and Vickerstaffs' theory for dyeing of cotton with direct dye. | **07** |
| | **(b)** | Explain: Activation energy of diffusion and Half dyeing time. | **07** |
| **Q.4** | **(a)** | Explain elaborately various techno-physical aspect of soaping of vat dyed textile material. | **07** |
| | **(b)** | Explain: Donnan theory of membrane equilibrium. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | State different theories proposed for dyeing of nylon. Describe Peters' theory in detail. | **07** |
| | **(b)** | Discuss the dyeing of wool with acid dyes. | **07** |
| **Q.5** | **(a)** | Discuss how the rates of reactivity study are crucial in deciding the suitability of reactive dye. | **07** |
| | **(b)** | Discuss the adsorption behavior of azoic coupling component as a function presence of alkali. | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | Explain the concept of Entropy of dyeing. | **04** |
| | **(b)** | Explain: Maximum dye combining power of wool. | **03** |
| | **(c)** | Explain: Electrical phenomenon of dyeing. | **07** |

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