

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-V (OLD) - EXAMINATION – SUMMER 2017****Subject Code: 151303****Date: 01/05/2017****Subject Name: Physico- Chemical Treatment Technologies****Time: 02:30 PM to 05:00 PM****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) Write a short note: Analysis of wastewater flow rates **07**  
(b) Explain in detail characteristics of water and wastewater **07**
- Q.2** (a) Write down expressions for head loss determination through screen **07**  
(b) Write a short note: Types of grit chambers **07**
- OR**
- (b) Explain the purpose of preliminary treatment of water and wastewaters. How it is achieved? **07**
- Q.3** (a) Explain chemistry of metallic coagulants in detail **07**  
(b) Explain in detail types of settling **07**
- OR**
- Q.3** (a) Explain in detail types of (i) Flocculation (ii) Flocculators **07**  
(b) Determine the terminal settling velocity of a spherical particle having a diameter of 0.6 mm and specific gravity of 2.65. Assume that the settling is type I and the temperature of the water is 22 °C. Take density and viscosity of water at 22 °C as 997 kg/m<sup>3</sup> and 9.2 x 10<sup>-4</sup> N.s/m<sup>2</sup> **07**
- Q.4** (a) Explain different types of filters. **07**  
(b) Discuss the factors affecting disinfection with chlorine, ozone and ultraviolet radiation **07**
- OR**
- Q.4** (a) Explain various modes of filter operation **07**  
(b) Why sludge treatment is required? Explain gravity thickener **07**
- Q.5** (a) Determine the amount of methane produced from 1 kg of BOD stabilized. Assume that the BOD contribution is due to glucose. **07**  
(b) What do you mean by the terms (i) elutriation (ii) chemical conditioning **07**
- OR**
- Q.5** (a) Draw a neat sketch of Vacuum filter and sludge drying bed **07**  
(b) Write a short note on Aerobic sludge digestion **07**

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