

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE SEM-VI Examination-Nov/Dec-2011**

**Subject code: 160604**

**Date: 28/11/2011**

**Subject Name: Water and wastewater engineering**

**Time: 10.30 am -1.00 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) Describe various factors affecting per capita demand of water. **07**  
(b) Describe various types of sewers based on their size and wastewater discharge carried by them. **07**
- Q.2** (a) Draw the neat sketch of intake structure and describe its design procedure. **07**  
(b) Describe the procedure of design of pumps and rising main. **07**
- OR**
- (b) Design a sewer to carry a wastewater discharge of  $0.25\text{m}^3/\text{sec}$  with a slope of 1 in 50. **07**
- Q.3** (a) Prove that surface overflow rate governs the removal of suspended solids in a plain sedimentation tank. **07**  
(b) Design a plain sedimentation tank for water supply scheme having capacity to treat the water = 10MLD. **07**
- OR**
- Q.3** (a) Draw the neat sketch of a clariflocculator and show its various parts. **07**  
(b) How will you find out optimum dose of Alum. Explain the experiment in detail **07**
- Q.4** (a) Explain the activated sludge process. **07**  
(b) Write short note on septic tanks and explain its design procedure. **07**
- OR**
- Q.4** (a) Draw the neat sketch of Trickling filter and explain its working. **07**  
(b) Explain the sludge digestion process. **07**
- Q.5** (a) Write short note on sludge drying beds. **07**  
(b) How will you decide storage capacity of ESR. **07**
- OR**
- Q.5** (a) Describe the methods of removal of hardness of water. **07**  
(b) Explain daily variation of sewage flow. How will you estimate the wastewater discharge for design of a wastewater treatment plant? **07**
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