

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE – SEMESTER – VI (OLD).EXAMINATION – WINTER 2016**

**Subject Code: 160604****Date: 26/10/2016****Subject Name: Water & Waste Water Engineering****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.

- Q.1 (a)** Draw a layout of a water supply scheme and explain each component in detail **07**  
**(b)** Explain river intake with neat sketch. **07**

- Q.2 (a)** Enlist different methods of population forecasting. Find the estimated population in 2031 and 2041 using the data given below by any two methods **07**

Year	Population
1981	23000
1991	40000
2001	52000
2011	59000

- (b)** Enumerate different sources of water. Explain surface water source in detail **07**  
**OR**

- (b)** Enlist different types of pipes which are used for conveying water. Explain any two of them in detail. **07**

- Q.3 (a)** Derive the equation of settling velocity for a discrete particle. **07**  
**(b)** Differentiate between slow sand and rapid sand filter. **07**

**OR**

- Q.3 (a)** Explain working of clariflocculator with neat sketch. **07**  
**(b)** Explain any two layout of distribution network in details. **07**

- Q.4 (a)** Design a plain sedimentation tank for treating 8 MLD of water **07**  
**(b)** Differentiate between trickling filter and activated sludge unit as a method of secondary treatment of sewage. **07**

**OR**

- Q.4 (a)** Design a grit chamber for treating 0.1m<sup>3</sup>/sec of wastewater. **07**  
**(b)** Explain different types of manholes used in sewerage system. **07**

- Q.5 (a)** What is meant by self cleansing velocity? State and explain shields expression for self cleansing velocity **07**  
**(b)** Explain with neat sketch septic tank and soak pit. **07**

**OR**

- Q.5 (a)** Differentiate between aerobic and anaerobic as well suspended and attach growth process with reference to the biological treatment of sewage. **07**  
**(b)** Draw a typical layout of wastewater treatment plant. Explain function of each unit. **07**

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