

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

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

**GUJARAT TECHNOLOGICAL UNIVERSITY**

**BE - SEMESTER-VI (NEW) - EXAMINATION – SUMMER 2018**

**Subject Code:2160604**

**Date:05/05/2018**

**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) Write short note on Break point chlorination. **03**  
(b) What is the necessity of water supply scheme? Draw a Complete flow diagram of water treatment plant. **04**  
(c) What is per capita demand? Discuss factors affecting per Capita demand. **07**
- Q.2** (a) Explain Arithmetical Increase Method of population forecast. **03**  
(b) Write a short note on Reflux Valve. **04**  
(c) What is an intake structure? Sketch and explain construction and working of a river intake. **07**
- OR**
- (c) Prove that surface overflow rate governs the removal of suspended solids in a plain sedimentation tank. **07**
- Q.3** (a) Write short note on Dead end system of water distribution network. **03**  
(b) Write short note on Coagulation. **04**  
(c) What are the different types of pipes used for water supply? Discuss cast iron pipes and concrete pipes in detail. **07**
- OR**
- Q.3** (a) Define (1) Garbage (2) Rubbish (3) Sewage **03**  
(b) Differentiate between temporary hardness and permanent hardness. **04**  
(c) Give comparison between slow sand filter and rapid sand filter. **07**
- Q.4** (a) Write short note on Softening of water. **03**  
(b) Write short note on R.C.C sewers. **04**  
(c) Sketch and discuss Manhole, Drop manhole and Lamp hole as sewer appurtenances. **07**
- OR**
- Q.4** (a) Write short note on Equalization. **03**  
(b) Explain the following terms in relation of disinfection. **04**  
(1) Pre chlorination (2) Post chlorination (3) Double chlorination (4) Super chlorination  
(c) Explain with neat sketch septic tank and state its design criteria. **07**

- Q.5** (a) Draw a typical flow diagram for municipal waste water treatment plant and show location of screen in it. **03**
- (b) Differentiate between Activated sludge unit and Trickling filter. **04**
- (c) Design a primary settling tank of rectangular shape for a town having population of 40,000 with water supply of 135l/c/d. **07**

**OR**

- Q.5** (a) Differentiate between Attached growth process and Suspended growth process. **03**
- (b) How aerobic digester differ from anaerobic digester. **04**
- (c) An average operating data for conventional activated sludge treatment plant is as follows: **07**
- (1) Waste water flow = 30,000m<sup>3</sup>/d
  - (2) Volume of aeration tank = 10,000 m<sup>3</sup>
  - (3) Influent BOD = 250 mg/l
  - (4) Effluent BOD = 20 mg/l
  - (5) MLSS = 2500 mg/l
  - (6) Effluent SS = 30 mg/l
  - (7) Waste sludge SS = 9000 mg/l
  - (8) Quantity of waste sludge = 200 m<sup>3</sup>/d
- Based on above data determine
- (1) Aeration period
  - (2) F/M ratio
  - (3) BOD removal efficiency in percentage
  - (4) Sludge age, days