

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – WINTER 2018****Subject Code:2160604****Date:30/11/2018****Subject Name:Water & Waste Water Engineering****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) Give the classification of intake. **03**
 (b) Differentiate between slow sand filter and rapid sand filter **04**
 (c) Design a plain sedimentation tank for treating 10 MLD of water **07**
- Q.2** (a) What are the objectives of water treatment **03**
 (b) State and explain different components of water supply scheme **04**
 (c) Explain with neat sketch the working of trickling filter **07**
- OR**
- (c) Enlist different types of pipes used for water supply. Explain Cast iron pipe in detail. **07**
- Q.3** (a) How will determine the optimum dose of a coagulant for a given quality of raw water **03**
 (b) Explain different factors affecting the selection of a proper water treatment train. **04**
 (c) A main combined sewer is to be designed to serve an area of 20 sq. km with a population density of 250 persons/hectare. The average rate of sewage flow is 300 litres/capita/day. The maximum flow is 60% in excess of average together with the rainfall equivalent of 15 mm in 24 hours, all of which appears as runoff. Determine the capacity of the sewer. Taking the maximum velocity of flow as 2.0 m/s, determine the size of the circular sewer. **07**
- OR**
- Q.3** (a) Define: 1. Super chlorination 2. Dechlorination 3. Post chlorination **03**
 (b) What are the requirements of a good distribution system? **04**
 (c) Explain different layouts of distribution network with their relative advantages and disadvantages. **07**
- Q.4** (a) Write a short note on soak pit. **03**
 (b) What is rising main? Explain how you will find out economical diameter of rising main and head loss in rising main. **04**
 (c) Draw a typical flow sheet of a municipal wastewater treatment plant and explain the functions of each unit. **07**
- OR**
- Q.4** (a) Explain how symbiotic relationship between algae and bacteria is used in oxidation pond used for treatment of sewage. **03**
 (b) Explain break point chlorination. **04**
 (c) Explain the need of low cost sanitation system. Explain the design steps of septic tank **07**
- Q.5** (a) Differentiate between separate and combined sewerage system. **03**
 (b) Differentiate between trickling filter and activated sludge unit. **04**
 (c) Enlist different sewer appurtenances and describe deep man hole in detail. **07**

OR

- Q.5** (a) What is water softening? When it is required? Enlist different methods used for water softening. **03**
- (b) Explain how will find the capacity of an elevated service reservoir in a water distribution system. **04**
- (c) Why preliminary treatment is needed before primary and secondary treatment of wastewater. Explain working of any two units used for preliminary treatment of wastewater. **07**
