

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V (NEW) EXAMINATION – WINTER 2022****Subject Code:3151303****Date:06-01-2023****Subject Name:Physico-chemical Treatment Technology****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.
4. Simple and non-programmable scientific calculators are allowed.

MARKS

- Q.1** (a) What is unit process? List down different unit processes used for waste water treatment. **03**
- (b) Explain the procedure for statistical analysis of wastewater flow rate data. **04**
- (c) Draw a neat sketch of conventional water treatment plant and explain the function of each unit **07**

- Q.2** (a) Give the detail classification of Screens with their opening size. **03**
- (b) Why are screens necessary before the treatment of wastewater? **04**
- (c) Explain the construction and working of a Rapid Sand Filter along with a neat sketch. **07**

OR

- (c) Explain the construction and working of a Slow Sand Filter along with a neat sketch **07**

- Q.3** (a) Write a note on “Operational difficulties of RSF”. **03**
- (b) Write a short note on Mud-ball formation in Sand filter. **04**
- (c) Draw neat sketches of Micro-filtration treatment for surface water. **07**

OR

- Q.3** (a) Enlist and explain the disinfectants used for water treatment. **03**
- (b) Enlist the factors affecting disinfection. **04**
- (c) With the help of a neat sketch explain the concept of “Break point Chlorination.” **07**

- Q.4** (a) Write a short note on Aerated Grit Chamber. **03**
- (b) Enlist and explain the factors affecting the process of chlorination. **04**
- (c) Explain the jar test procedure for determining the optimum dose of chemical Coagulant. What is the relationship between pH, Alkalinity and the alum dose? **07**

OR

- Q.4** (a) Enlist the assumptions for ideal sedimentation tank. **03**
- (b) Explain the phenomenon of flocculation for water and waste-water treatment. **04**
- (c) Write a short note on “Colloidal Stability”. What are the mechanisms of Destabilization of colloids? **07**

- Q.5** (a) Enlist methods of dewatering and explain any one in detail. **03**

- (b) Describe Newton's law (Stokes law) for settling velocity of discrete particles. **04**
- (c) Prepare a list of different chemical coagulants. Explain chemical reactions when alum is used as coagulants. **07**

OR

- Q.5** (a) Discuss the objectives of treatment of sludge. **03**
- (b) Explain Sludge Drying bed and its design criteria. **04**
- (c) Describe the methods normally used to process the sludge before its final disposal. **07**
