

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER- V (New) EXAMINATION – WINTER 2019

Subject Code: 2151303

Date: 25/11/2019

Subject Name: Physico - Chemical Treatment Technologies

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.

| | | Marks |
|------------|---|-----------|
| Q.1 | (a) Why are screens necessary before the treatment of wastewater? | 03 |
| | (b) Write a short note on grit removal mechanism. | 04 |
| | (c) Derive the Stokes law for settling velocity of discrete particles. | 07 |
| Q.2 | (a) Define : (1) SOR (2) WOR (3) Scour velocity | 03 |
| | (b) Differentiate between unit process and unit operations. | 04 |
| | (c) Write a Short note with a neat sketch on “Horizontal flow Grit Chamber”. | 07 |
| | OR | |
| | (c) Write a short note on “Breakpoint chlorination”. | 07 |
| Q.3 | (a) Explain the terms along with their values for RSF (i) Uniformity coefficient (ii) Effective size | 03 |
| | (b) Differentiate between Physical treatment & Chemical treatment for waste water. | 04 |
| | (c) Enlist the different types of mixing equipments & explain any one with sketch. | 07 |
| | OR | |
| Q.3 | (a) Differentiate between: Coagulation and Flocculation | 03 |
| | (b) Explain various physical and chemical characteristics of water and waste-water. | 04 |
| | (c) Explain the procedure for statistical analysis of waste water flow rate data. | 07 |
| Q.4 | (a) Enlist the factors which affect chlorination. | 03 |
| | (b) Differentiate between discrete and flocculent settling. | 04 |
| | (c) Explain the mechanisms of filtration. | 07 |
| | OR | |
| Q.4 | (a) List down the various methods used for particle destabilization. | 03 |
| | (b) Write a short note on ‘Tube Settlers’ | 04 |
| | (c) Explain with neat sketch: dissolved air flotation for surface water treatment. | 07 |
| Q.5 | (a) Prepare a list of disinfectants and explain any one in brief. | 03 |
| | (b) Write down the sources and effects of the following parameters in water (i) Organic matter (ii) Turbidity | 04 |
| | (c) Explain Sludge Drying bed and its design criteria. | 07 |
| | OR | |
| Q.5 | (a) Enlist and explain the mechanisms by which the colloids are stabilized. | 03 |
| | (b) Explain the term “Zeta Potential” with neat sketch. | 04 |
| | (c) Explain aerobic and anaerobic sludge digestion. | 07 |
