

GUJARAT TECHNOLOGICAL UNIVERSITY
M. E. - SEMESTER – I • EXAMINATION – WINTER • 2013

Subject code: 711806N**Date: 06-01-2014****Subject Name: Water and Wastewater Treatment Technologies****Time: 10.30 am – 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)** Enlist different chemical characteristics of water and wastewater and explain any two in details. **07**
- (b)** Differentiate (a) SOR and WOR (b) RSF and SSF **07**
- Q.2 (a)** Draw the complete flow diagram of conventional WWTP and explain the purpose of each unit. **07**
- (b)** Why BOD is determined for five days at 20⁰C. Determine BOD at 15⁰C for 8 days if BOD at 20⁰C for 5 days is 150 mg/L. Take k value as 0.23 per day. **07**
- OR**
- (b)** What is the importance of BOD/COD ratio? Describe the step wise process of determination of COD in laboratory. **07**
- Q.3 (a)** Discuss different types of settling phenomena's and give at least one example of each types of settling phenomena's. **07**
- (b)** Explain the mechanism of coagulation and with chemical reactions discuss the processing of alum coagulant. **07**
- OR**
- Q.3 (a)** Differentiate (a) Stability and instability forces in mechanism of coagulation (b) Total and zeta potential **07**
- (b)** Discuss the Stock's law of sedimentation and prove that settling velocity does not depend upon depth of sedimentation tank. **07**
- Q.4 (a)** Draw the neat sketch of RSF and describe the backwashing of RSF **07**
- (b)** Explain the environmental significance of (a) Nitrates and Nitrite (b) TDS and TSS (c) MPN **07**
- OR**
- Q.4 (a)** Why velocity control device is to be provided in grit chamber? Explain the working of aerated grit chamber. **07**
- (b)** What do you mean by kinetic coefficient? Describe first order and second order kinetic equations. **07**
- Q.5 (a)** Why recirculation of sludge is necessary in ASP? Write the mass balance equation for completely mixed reactor with sludge return. **07**
- (b)** Differentiate between attached growth and suspended growth and with neat sketch explain the working of trickling filter. **07**
- OR**
- Q.5 (a)** What is extended aeration? Derive the equation for finding the volume of ASP. **07**
- (b)** How does sludge from PST and SST differs? Discuss the factors affecting sludge digestion process. **07**
