

Total No. of Questions : 8]

SEAT No. :

**P4230**

**[4860]-614**

[Total No. of Pages : 2

**M.E. (Civil - Water Resource and Environmental Engineering)**  
**ADVANCED WASTE WATER TREATMENT**  
**(2012 Course) (501610)**

*Time : 3 Hours]*

*[Max. Marks : 100*

*Instructions to candidates:*

- 1) Answer any three questions from each section.*
- 2) Figures to the right indicate full marks.*
- 3) Assume suitable data if necessary clearly mentioning the same.*
- 4) Use of non - programmable scientific calculator is allowed..*

**SECTION - I**

**Q1) a)** Write the basic principle and function for the grit chamber and primary sedimentation tank. **[10]**

b) Write the five characteristics of wastewater with significance and effluent standards for the same parameters. **[6]**

**Q2) a)** Explain basic mass balance reactions for aerobic and anaerobic process. **[10]**

b) Explain the kinetics of biological growth. **[6]**

**Q3) a)** Write short note on. **[10]**

- i) Grit Chamber
- ii) Disposal of grit material.

b) Design PST 1 MLD . Assume the necessary data. **[8]**

**P.T.O**

- Q4)** a) Explain the factor affecting coagulation and flocculation process. [10]
- b) Explain the factors considered in designing of flow equalization tank.[6]

### **SECTION - II**

- Q5)** a) Explain any one modification of activated sludge process. [6]
- b) A two stage trickling filter is designed for an organic loading of 10000 kg of BOD in raw sewage per Ha-m per day. Recirculation ratio is 1.5. The filter treats 30 mld of raw sewage with a BOD of 200mg/l.using NRC equation, determine the strength of the effluent. [10]
- Q6)** a) Explain the objectives of the modification of ASP. [6]
- b) Explain with a neat sketch : working of a two stage digester. Explain empirical formulae used to find the volume of the two stage digester.[10]
- Q7)** a) Write short note on [10]
- i) Reverse osmosis.
- ii) Desalination.
- b) Explain the theory of adsorption with any example. [6]
- Q8)** a) Explain any two methods for the removal of dissolved solids. [10]
- b) Compare ASP and TF. [8]

