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**B.Tech. Civil (Construction Management) /
B.Tech. Civil (Water Resources Engineering)**

Term-End Examination

December, 2013

**ET-507(A) : POLLUTANTS AND WATER
SUPPLY**

Time : 3 hours

Maximum Marks : 70

Note : Attempt any five questions. All questions carry equal marks. Assume any data suitably, if necessary only. Use of calculator is permitted.

1. (a) With the help of a neat sketch explain any one of the following : 7
(i) Electrostatic Precipitator
(ii) Fabric Filter
- (b) What do you understand by "Biochemical Oxygen Demand" ? BOD₅ of a sample is measured as 200 mg/l at 20°C. Compute the ultimate (first stage) BOD, and 10 days BOD at 20°C. Take K = 0.21 per day. 7
2. (a) Following is the census data of a town. Estimate its population in the year 2031 by using Incremental Increase Method. 7

Year	Population
1951	18000
1961	26000
1971	36000
1981	48000
1991	63000
2001	75000
2011	85000

- (b) Differentiate between confined and unconfined aquifer. Derive the expression for determining the discharge from an unconfined aquifer. 7
3. (a) With the help of a neat sketch, explain the construction and working of a Rapid Sand Filter. 7
- (b) What is meant by disinfectioning? Describe the advantages of using liquid chlorine as a disinfectant. 7
4. (a) Describe the merits and demerits of zeolite softner. 7
- (b) What are different methods of removing temporary and permanent hardness? Briefly explain. 7
5. (a) Explain the difference in operating characteristics of Centrifugal and Reciprocating Pumps. 7

- (b) A double acting reciprocating pump has to discharge 1100 lit/min of water running at 48 rpm. The diameter and stroke of pump are 200 mm and 400 mm respectively. Suction and delivery heads are 6 m and 20 m. Determine the power required to drive the pump; Also, determine the slip of pump. 7
6. Draw neat sketches and explain various types of layouts of water distribution system. Also describe merits and demerits of each type of layout system. 14
7. Write short notes on *any four* of the following :
- (a) Composting 4x3½=14
 - (b) Break point chlorination
 - (c) Water Hammer
 - (d) Reverse Osmosis
 - (e) Sluice valves
 - (f) Fire hydrants
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