Civil

COLLEGE OF ENGINEERING PUNE

Name of the examination: End Semester Examination Academic Year 2012-13

Subject code: CE -301 **Name of subject: Environmental Engineering**

Programme: T.Y. B. Tech. (Civil) Date: May 04, 2013

Max. Marks: 50 **Duration: 3 hrs**

Instructions:

1. **Attempt any five questions from following in a sequence.**
2. **Draw neat sketches wherever required.**
3. **Assume suitable data if necessary.**
4. **Use of scientific calculator is allowed.**
5. **Figures to the right indicate full marks.**

Q.1. a) Enlist air pollution control equipments and explain with examples, control at source. **05**

b) What is ozone layer depletion? Discuss in brief its effects and control measures **05**

Q. 2 a) Enlist population forecasting methods .Explain the factors which affect growth of population in any area. **05**

b) Explain with sketches Inlet & Outlet arrangements in sedimentation tank. **05**

Q. 3 a) Derive expression for settling velocity using Newton' law and Stokes 'law. **05**

b) Prove that settling velocity does not depend on depth of water in settling zone and explain tube settler with a sketch. **05**

Q.4 a) Enlist different coagulants and Explain their chemical reactions with water **05**

b) A coagulation plant treats 40 MLD of water with 18 mg/lit of alum dose. If raw water alkalinity is 3.5 mg/l of $CaC0_3$. Work out annual consumption of alum and 80% pure quick lime. **05**

Q. 5 a) Write the classification of filters. Explain mechanism of filtration **05**

b) A water work treats 6 MLD of water with rate of filtration as 5000 lit / Sq. M/ Hr. **05**

Design number and dimensions of rapid sand gravity filters, thickness of sand and gravel layers and details of under drainage system if area of perforation is 0.2 % of filter area, Break through index = 4×10^{-4}, terminal head loss 2.5 mt, average sand 0.6 mm, gravel size 50 mm & K = 12

Q.6 **a)** Enlist various methods of disinfection. Compare disinfection with chlorine and ozone **05**

b) Explain with chemical reaction lime soda process of softening. Write advantages and disadvantages of this method **05**

Q. 7 **a)** Draw a sketch of a pressure filter. Explain their advantages and disadvantages **05**

b) Determine analytically the required capacity of a service reservoir for the following demand rates if **05**

a) water is supplied continuously

b) water is supplied at 6 am to 10 am and 4 pm to 8 pm

Hours	0-4 am	4-6 am	6-8 am	8-10 noon	10-12 noon	12-16 pm	16- 18 pm	18-20 pm	20-24 pm
Demand in 1000 lit.	40	140	360	290	180	120	180	320	100