

Total No. of Questions : 10]

SEAT No. :

**P3473**

**[5560]-110**

[Total No. of Pages : 3

**T.E. (Civil)**

**ENVIRONMENTAL ENGINEERING - I**  
**(2012 Course) (Semester - II)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6 Q.7 or Q.8, Q.9 or Q.10*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables are allowed.*
- 5) *Assume suitable data, jf necessary.*

**Q1)** a) Write a short note on jack well and also draw a neat sketch of jack well. [6]

b) Explain working principle of bag filter with a neat sketch. [4]

OR

**Q2)** a) Enlist different methods of population forecasting and Explain in detail one of them. [6]

b) Following are the SPLs of 6 machines in a factory. Find the total SPL when all the machines are in operation. [4]

Machine No.	1	2	3	4	5	6
SPL in dB	78	81	81	79	72	65

Refer the following table for determining the cumulative decibel SPL when the differences between two or more levels are known

**P.T.O.**

Difference between levels, dB	No. of dB to be added to higher level
0	3.0
1	2.6
2	2.1
3	1.8
4	1.5
5	1.2
6	1.0
7	0.8
8	0.6
10	0.4
12	0.3
14	0.2
16	0.1

**Q3) a)** What are the various types of plain sedimentation basins? Explain any one type of basin with a neat sketch. [6]

b) Write a brief note on Aeration in water treatment. [4]

OR

**Q4) a)** Prove that theoretically, the surface loading (Q/A) and not the depth is a measure of effective removal of particles in a sedimentation tank. [6]

b) Write a procedure for the determination of chloride of water. [4]

**Q5) a)** Design a mechanical flocculator to treat water for a population of one lakh, water being supplied at the rate of 150 litres per capita per day. The temperature of water is 30°C, detention time is 30 minutes and paddle speed is 3 r.p.m. kinematic viscosity at 30° C =  $0.8039 \times 10^{-6} \text{ m}^2/\text{sec}$ . [8]

b) Draw a neat sketch of a rapid sand gravity filter and show various components. Explain mechanisms of rapid sand gravity filter. [8]

OR

- Q6) a)** Explain in detail, the working of a circular clariflocculator. Draw the typical cross-section of a circular clariflocculator, showing various components. [8]
- b)** Explain break point chlorination with sketch. [8]

- Q7) a)** Write short note on [8]
- i) Chloramines
  - ii) Effect of pH on chlorination
  - iii) Plain chlorination
  - iv) Post chlorination
- b)** Explain odour and colour removal of water using activated carbon. [8]

OR

- Q8) a)** What do you mean by disinfection? Discuss the factors affecting efficiency of disinfection. Enlist at least four disinfectants used in water treatment plant and discuss anyone in detail. [8]
- b)** Explain with necessary chemical reactions 'Lime Soda Process' of water softening. Also explain advantages of this method. [8]

- Q9) a)** Explain RO process with a neat sketch. [9]
- b)** What is service reservoir? What are its functions? Explain anyone with a neat sketch. [9]

OR

- Q10) a)** What is packaged water treatment plant? What are the advantages of packaged water treatment plant? [9]
- b)** Explain the following layout systems for water distribution: [9]
- i) Tree or Dead end System
  - ii) Ring or Circular System

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