Total No. of Questions : 12]

SEAT No. :

P2386

[Total No. of Pages : 3

[5153]- 9
T.E. (Civil)
ENVIRONMENTAL ENGINEERING - I
(2008 Pattern) (Semester - II)

Time :3 Hours] *[Max. Marks :100*

Instructions to the candidates:

1) ***Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6 from SECTION I and Q.7 or Q.8, Q.9 or Q.10, Q.11 or Q.12 from SECTION II***
2) ***Answers to the two sections should be written in separate books.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***
5) ***Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.***
6) ***Assume suitable data, if necessary.***

SECTION - I

Q1) a) Enlist different methods of population forecasting and explain in detail one of them. **[6]**

b) Explain with a neat sketch the working, location and function of river intake. **[6]**

c) What is design period? State its importance in water supply system design. **[6]**

OR

Q2) a) Define the term "per capita demand". Write the factors affecting "per capita demand". **[6]**

b) List the physical characteristics of water. State the IS standards recommendation for any four. **[6]**

c) Write an importance of pHin treatment of water. **[6]**

Q3) 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. Temperature of water is 30ºC, detention time is 30 minutes and paddle speed is 3 r.p.m. kinematic viscosity at 30º C = 0.8039×10^{-6} m^2/sec. **[8]**

b) What is coagulation? What are the factors on which the dosages of coagulants depend? **[8]**

OR

P.T.O.

Q4) a) Draw a neat sketch of circular sedimentation tank. Explain the sedimentation process used in water treatment plant. **[8]**

b) Draw a neat sketch of any one type of aerator for treatment of water. State the objectives of aeration process in water treatment. **[8]**

Q5) a) Draw a neat sketch of a slow sand gravity filter and explain filtration process. **[8]**

b) State and explain the factors affecting on disinfection. **[8]**

OR

Q6) a) Write short note on **[8]**

i) Effect of pH on chlorination

ii) Plain chlorination,

iii) Post chlorination and

iv) Super chlorination

b) With a neat sketch explain back washing of rapid sand gravity filter. **[8]**

SECTION - II

Q7) a) Why softening of water is necessary? Explain the process of water softening. **[9]**

b) Discuss colour and odour removal by adsorption. **[9]**

OR

Q8) a) Explain demineralization of water by Reverse Osmosis method with a neat sketch. **[9]**

b) Explain ion exchange method of water softening with a neat sketch. **[9]**

Q9) a) What is packaged water treatment plant? What are the advantages of packaged water treatment plant? **[8]**

b) Explain the following layout systems with a neat sketch for water distribution: **[8]**

i) Tree or Dead end System

ii) Ring or Circular System

OR

Q10)a) Define rain water harvesting. Write different types of rain water harvesting system and explain any one in detail. **[8]**

b) Explain detection and prevention of wastage of water. **[8]**

Q11)a) Discuss the sources and effects of noise pollution and explain the noise control techniques. **[8]**

b) Explain primary and secondary air pollutants and state their importance. **[8]**

OR

Q12)a) Calculate the storage capacity of the distribution reservoir from the following data. **[8]**

i) Daily demand = 2,25,000 litres

ii) Pumping hours = 9 hours per day between 8 am to 5 pm.

iii) Pattern of draw off is as follows

Supply hours	Percentage of day's supply
7 am to 8 am	30%
8 am to 5 pm	35%
5 pm to 6.30 pm	30%
6.30 pm to 7 am	5%

b) Explain the principle and working of settling chamber. for removing particulate matter. **[8]**