

**EASWARI ENGINEERING COLLEGE**  
**DEPARTMENT OF CIVIL ENGINEERING**

**Question Bank**

**EN-8592 WASTEWATER ENGINEERING**

**UNIT I**

**Part – A**

1. What are the methods of population forecasting?
2. Define design period? What are the factors governing the design period?
3. What are the various type of water demand?
4. What are the various type of water available on the earth?
5. What is hydrologic cycle?
6. What are rivers? What are the types of river?
7. What is jack well?
8. What are springs? What are the types of springs?
9. What are artesian springs?
10. What are the different types of wells?
11. What are the factors governing the selection of a particular source of water?
12. What are various type pressure pipes?
13. What are the advantages and disadvantages of cast iron pipes?
14. How the corrosion of metal pipes is reduced?
15. What are the factors governing location of intake?
16. What are the types of intake?
17. What are tube wells?

18. What are the factors affecting per capita demand?
19. What are the various methods of purification of water?
20. Define detention period?

**Part–  
B**

1

- . Explain the laying, jointing and testing of waste water treatment pipes.
- 2 The population of 5 decades from 1930 to 1970 is given below in the table. Find out the population
- . of 1, 2, 3 decade beyond the last known decade by using arithmetic increase method.

Year	1930	1940	1950	1960	1970
Population	250	280	340	420	470

3

- . What are the factors affecting per capita demand?
- 4 Explain in brief the different methods for prediction of future population of a city with reference to
- . design of water supply system.
- 5
- . Write a note on common impurities found in water.
- 6
- . Describe with a neat sketch the reservoir intake for an earthen dam.
- 7 State the comparative merits and demerits of the following materials used in the conveyance of water, (a).C.I (b) Steel (c) Concrete
- .

**UNIT –II**

**Part – A**

1. Define coagulation?
2. Define filtration? What are the 2 types of filter?
3. What is schmutzdecke or dirty skin?
4. Define uniform coefficient?
5. Differentiate between slow and rapid sand filter with respect to
  - (a) Rate of filtration
  - (b) loss of head.

6. Define sterilization?
7. What is chloramine?
8. What is softening?
9. What are the methods of removing permanent hardness?
10. Define alkalinity?
11. What is permutit?
12. How are aeration water carried out?
13. Define fluoridation?
14. What are the methods of desalination?
15. What is different system of distribution networks?
16. What are various methods of distribution system?
17. Define fire storage?
18. Enumerate various chemical parameter of water?

**Part – B**

1. Explain the different water distribution system layouts with neat sketches.
2. Explain the principles in designing of water supply and drainage in buildings.
3. What are intake towers? Explain in brief with neat diagram?.
4. What is sedimentation tank? What are the different types of sedimentation tanks?
5. Sketch and explain the salient points of the various types of distribution network?
6. Write the difference between slow sand and rapid sand gravity filter?
7. Explain distribution reservoirs briefly?
8. Explain the method of purification of water?
9. Describe the various methods of application of coagulants.
10. What is flocculation? Explain with neat sketch a flocculator with mechanical agitators.

**UNIT-III**

**Part – A**

1. What are the two types of sewage system?
2. What are the two types of water meter?
3. Define time of concentration?
4. List the components of sewerage system?
5. What is peak drainage disturbance?
6. Mention some shapes of sewer pipe

7. What are the forces acting on sewer pipes?
8. What are the materials used for constructing sewer pipes?
9. Give some qualities of the good sewer pipes
10. Define sewer appurtenances
11. Mention the classification of manholes
12. What is meant by catch basins?
13. Define inverted siphons
14. What are the various methods of ventilation for sewers?
15. What are the different types of pumps used commonly for pumping the sewage?

**Part – B**

1. Discuss the various principles of designing drainage system for buildings.
2. Explain the construction steps involved in laying of a sewer line.
3. What are joints? What are the different types of joints? Explain in brief with neat diagram?
4. What are pipe appurtenances? Explain in brief with neat diagram?
5. Explain the different plumbing systems with neat sketches. And also compare the plumbing systems.
6. Explain the design of an inverted siphon?
7. Explain pumping station with neat diagram?
8. Write short notes on: (a) Drop man holes (b) Lamp holes (c) Cleanouts (d) Street inlet called gullies.
9. What are the shapes of sewer pipes? Explain in detail.
10. Describe the procedure laying and testing of sewer pipes.
11. Estimate the rational method of estimating of storm water flow.
12. (i) Design a bar screen for peak average flow of 30 million litres per day. (8)
- (ii) Determine the settling velocity of spherical particle of specific gravity 2.65, diameter 0.18 mm. Take kinematic viscosity of water as  $1.01 \times 10^{-2}$  m<sup>2</sup>/sec. (6)
13. Design a rectangular sedimentation tank for treating 4.5 million litres per day adopting L : B ratio as 2, overflow rate 20 3 2 m /d.m and detention time of 3 hours

**UNIT IV**

**Part A**

1. What is the purpose of using velocity control device in a grid chamber?

2. Mention the classification of treatment process of sewage.
3. State the purpose of using the skimming tanks.
4. Why baffles are provided in the sedimentation tank in sewage treatment?
5. What are the operational troubles in trickling filter?
6. What are the types of trickling filters?
7. Define sludge age.
8. Define sludge volume index.
9. What is meant by biodegradable organic matter?
10. What are the various tests for finding the quality of sewage?
11. What is meant by relative stability of a sewage effluent?
12. What are the methods of disposing the sewage effluent?
13. What are the different types of sewage treatment?
14. Define sludge digestion.
15. What are the stages in the sludge digestion process?  
What is meant by ripened sludge?  
What are the factors affecting sludge digestion?

**PART - B**

1. Describe the step involved in the design of septic tank. And also explain the working of a trickling filter with neat sketch.
2. Explain the operational principles of stabilization ponds and Oxidation ditch.
3. Explain the design procedure of trickling filter with neat sketches.
4. What are the various secondary unit methods of treating sewage water? Distinguish between any two of them.
5. Write a note on S.S, BOD removal by plain sedimentation by primary sedimentation tank.

6. What do you understand by secondary treatment of sewage water? Explain the various methods of biological treatment.
7. Define and explain the different loading criteria, based on which aeration tank of ASP is operated.
8. Determine the size of a high rate trickling filter for the following data

Sewage flow = 4.5 million litres per day

Recirculation ratio = 7.

BOD for raw sewage = 6. =

BOD removal in PST = 30%

BOD of treated effluent required = 25 mg/l.

## UNIT V

### Part – A

1. Give different types of thicker unit.
2. What are the methods of disposal of septic tank effluent?
3. Define percolation rate.
4. What are the soil absorption systems?
5. What are the methods of applying sewage effluents to farms?
6. What is meant by oxygen sag curve?
7. What is meant by sewage sickness?
8. What are the preventive methods for sewage sickness?
9. Define dilution factor.
10. What is meant by self purification?
11. List various natural forces of self purification
12. What are the factors affecting the reduction?
13. What is meant by prim lake pollutant?
14. What is meant by de oxygenation curve?
15. How the river maintaining its clearness?
16. Name the biological zone in lakes.
17. What is meant by re-oxygenation?

18. What is meant by zone of recovery?
19. What is meant by sludge banks?

**Part – B**

1. Explain the methods available and limitations of land disposal of sewage.
2. Write short notes on (a) Wastewater reclamation (b) Sewage disposal to sea water (c) Land treatment.
3. Explain the Streeter Phelps model and its applications. Explain also the different techniques for waste water reclamation.
4. Explain the oxygen sag curve.
5. Explain the sewage disposal on land.
- 6.15.a) (i) Discuss the principle of the self-purification process of stream and factors influencing the process.  
(ii) Explain about oxygen sag curve and its importance
7. Enumerate various processes involved in sludge treatment and disposal. Explain the mechanism of anaerobic and aerobic sludge digestion with their relative merits and demerits.
8. A town discharges 14 million litres per day sewage at a temperature of  $23^{\circ}\text{C}$  into river having flow of  $1.7 \text{ m}^3/\text{sec}$  and water temperature of  $20^{\circ}\text{C}$ . BOD  $20^{\circ}\text{C}$  for the waste water is  $160 \text{ mg/l}$  and  $k$  (base 10) is 0.1 per day. If  $R$  is 0.2 per day what is the critical oxygen def  $c$  and the distance at which it occurs. Assume the stream as 92% saturated with oxygen before the sewage addition the solubility of oxygen at  $20^{\circ}\text{C}$  as  $9.0 \text{ mg/l}$  and river flow velocity as  $0.12 \text{ m/ c}$ .
- 9.(i) Describe the anaerobic sludge digestion process and explain the effects of pH and temperature on it.  
(ii) State the Indian standards for sewage disposal on land and conditions favoring it.