

B.E. Eighth Semester (Civil Engineering) (C.B.S.)
Elective - III : Water & Waste Water Treatment

P. Pages : 2

Time : Three Hours



NKT/KS/17/7545

Max. Marks : 80

- Notes :
1. All questions carry marks as indicated.
 2. Solve Question 1 OR Questions No. 2.
 3. Solve Question 3 OR Questions No. 4.
 4. Solve Question 5 OR Questions No. 6.
 5. Solve Question 7 OR Questions No. 8.
 6. Solve Question 9 OR Questions No. 10.
 7. Solve Question 11 OR Questions No. 12.
 8. Due credit will be given to neatness and adequate dimensions.
 9. Assume suitable data whenever necessary.
 10. Diagrams and chemical equations should be given whenever necessary.
 11. Illustrate your answers whenever necessary with the help of neat sketches.
 12. Use of non programmable calculator is permitted.

1. a) Explain the factor to be considered while selecting the site for water treatment plant? **6**
- b) Draw a flowsheet of conventional water treatment plant? Explain working of each unit in brief. **7**

OR

2. a) Write a short note on gas transfer in aeration process. **6**
- b) Design cascade aerator for the design flow of 18 MLD. **7**
3. a) Write down factor affecting coagulation & flocculation. **6**
- b) Design a flash mixer for $750\text{m}^3/\text{hr}$. **7**

OR

4. a) State type of coagulates used in water treatment plant & explain any two. **6**
- b) Design a ClarriFlocculator for design flow of $450\text{m}^3/\text{hr}$. **7**
5. Design a Rapid Sand Filter for Design Flow of 10 MLD with under drainage system. **14**

OR

6. a) What are the objective of filtration & Discuss the various factor affecting the filtration. **7**
- b) State the difference between slow sand filter & Rapid Sand Filter. **7**

7. a) Draw Flowsheet of conventional waste water treatment plant. Explain working of each unit in brief. 7
- b) Write down characteristics of waste water. 6

OR

8. a) Write short note on the Sewage sickness & Sewage Farming. 7
- b) Explain in detail self purification of stream? 6
9. a) Design a Grit Chamber Flow of $0.4 \text{ m}^3/\text{sec}$. Assume the peak flow rate to be 3 times average flow. 7
- b) Explain various types of screen used in waste water treatment plant. 7

OR

10. a) Design a circular sedimentation Tank for Town having population of 70,000. The average water Demand is 160 lpcd. Assume 75% water reaches at treatment unit & max demand is 2.7 times average demand. 7
- b) Enlist & explain in brief factor affecting anaerobic digestion. 7
11. a) Design the activated Sludge Treatment Unit with following data for town having population of 65,000. 7
- i) Average Sewage Flow = 200 lit/cap/day.
 - ii) B.O.D. of Row Sewage = 180 mg/lit.
 - iii) Suspended solid in raw sewage = 320 mg/lit.
 - iv) BOD Removed in Primary Treatment = 35%
 - v) Overall BOD Removal desired = 92%
- b) Explain working of UASB with neat sketch. 6

OR

12. a) Explain 'Activated Sludge Process' in detail with neat sketch. 7
- b) Write short notes on **any two**. 6
- i) BOD/COD Ratio
 - ii) MLSS & MLVSS
 - iii) Oxidation Pond
 - iv) Soak pit.
