

Reg. No. :

--	--	--	--	--	--	--	--	--	--	--	--

Question Paper Code : 40575

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Fifth/Sixth Semester

Civil Engineering

EN 8592 – WASTE WATER ENGINEERING

(Common to : Environment Engineering)

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is self cleaning velocity?
2. Define population equivalent.
3. Write the objectives of primary treatment of sewage.
4. Define detention period.
5. Write the purpose of aeration in activated sludge process.
6. What role does algae play in aerobic pond?
7. State the elements of man-balance analysis.
8. What is meant by SAR?
9. What are the factors affecting sludge digestion?
10. Why sludge has to be dewatered?

PART B — (5 × 13 = 65 marks)

11. (a) (i) A 350mm diameter sewer is to flow at 0.35 depth on a grade ensuring self-degree of self-cleansing equivalent to that obtained at full depth at a velocity of 0.8 m/sec. Calculate (a) the required grade. (b) associated velocity (c) the rate of discharge at this depth. Manning's rugosity coefficient = 0.014. (8)
- (ii) Explain the methods for corrosion control. (5)
- Or
- (b) (i) Explain the significance of DO, BOD and COD in wastewater. (8)
- (ii) Explain with neat sketch two pipe system of plumbing. (5)
12. (a) Explain the working principle of a grit chamber with its design criteria. (13)
- Or
- (b) (i) Explain the methods of grey water harvesting in a residential building. (9)
- (ii) Why are screens necessary before treatment of sewage? (4)
13. (a) (i) Explain with neat sketch the removal mechanism of an UASB. (8)
- (ii) Explain how extended aeration system is different from the activated sludge process. (5)
- Or
- (b) (i) Enumerate the problems in operation and maintenance of a trickling filter. (9)
- (ii) Enumerate the benefits of reuse of sewage. (4)
14. (a) (i) Enumerate the factors to be considered in sewage disposal by dilution. (7)
- (ii) Discuss the factors affecting self purification of river. (6)
- Or
- (b) (i) Develop streeter – Phelps model for self-purification process. (9)
- (ii) Describe the methods of sewage farming. (4)

15. (a) Explain with neat sketch the types of sludge thickeners. (13)

Or

- (b) Discuss the standard rate and high rate anaerobic digesters.

PART C — (1 × 15 = 15 marks)

16. (a) Design a septic tank with suitable soil dispersion system for a hostel having 175 students. Draw a neat sketch of the unit.

Or

- (b) Design a conventional ASP system for a proposal STP of 40 MLD capacity. The BOD of raw sewage is found to be 300 mg/L. Assume suitable design criteria.
-