

Roll No.

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

[F.T]
B.E / B.Tech END SEMESTER EXAMINATIONS – APRIL / MAY 2019 (A R R E A R)

CIVIL ENGINEERING BRANCH

SIXTH SEMSTER

CE 8605 - WASTEWATER ENGINEERING

(Regulation 2012)

Answer ALL Questions

Max. Marks 100

Time: 3 Hours

PART-A (10 x 2 = 20 Marks)



1. Name the types of sewerage systems or water carriage systems.
2. Explain the term 'Self-cleansing velocity' and 'Non scoring velocity'.
3. Differentiate between suspended solids and dissolved solids.
4. What is the purpose of screening in wastewater treatment ?
5. Define the term detention period .Why it is important, in the design aspect of treatment unit.
6. What are the end products of aerobic reactions and anaerobic reactions ?.
7. Name two disadvantages of Activate sludge process.
8. List the factors affecting the self purification of river.
9. Write the BOD and COD , CPCB standards for disposal on river water.
10. Define the term sludge .Name some disposal methods of sludge .

Part – B (5 x 16 = 80 marks)
(Question No.11 is Compulsory)

11. Design and draw a septic tank for a apartment with the following data :Nos. of users =300, peak discharge =300Lpm, desludging period =2 year. Assuming the percolation rate as 30minutes/cm. Design a dispersion trench for the disposal of the septic tank effluent.
12. a) i. Derive the first order BOD reaction.(6)
ii) Write any five parameters of wastewater and explain how will you measure those parameters .(10)
(OR)
b) i) Explain any three sewer appurtenances with diagrams (6)
ii)Determine the size of a circular sewer for a discharge of 1000 litres per second running half full . Assume $S= 0.0001$ and $n= 0.015$.(10)
13. a) i)The MLSS concentration in an aeration tank is 2500mg/l and the sludge volume after 30 minutes of settling in a 1000ml graduated cylinder is 215 ml . calculate i) SVI , ii)SDI, iii) required return sludge ratio and iv) SS concentration in the recirculated sludge .(10)
ii) Define organic loading rate (OLR) and hydraulic loading rate (HLR).(6)
(OR)
b) i)Explain the working principle of tricking filter with a neat diagram (10)

ii) Write the advantages and disadvantages of waste stabilization pond. (6)

14. a) i) Explain the zones of pollution in river. (6)
ii) Explain the oxygen sag curve with diagram and derive the Streeter Phelp's equation. (10)

(OR)

- b) i) A sewage effluent of 800 litres/sec with a BOD = 70 mg/L, DO content = 3.0 mg/L and temperature = 25°C enters a river where the flow is 30 m³/s and BOD = 3 mg/L, DO = 8.8 mg/L and temperature = 18°C. Determine the following for the mixture of the sewage and the river water: i) combined discharge ii) BOD iii) DO and iv) temperature. (10)
ii) Explain sewage disposal by land treatment. (6)

15. a) A settling tank treats 8 MLD of sewage containing 250 mg/l of suspended solids. The tank removes 60% of the suspended solids. Compute the weight and volume of the sludge produced daily if the moisture content of sludge is (a) 95% (b) 90%. Take specific gravity of sludge as 1.02. (10)
ii) Draw and explain sludge drying bed. (6)

(OR)

- b) i) Explain the anaerobic digestion mechanism. (6)
ii) A sewage containing 200 mg/l of suspended solids is passed through a primary settling tank. The solids from the primary settling tank are digested to recover the gas. Find the volume of methane and carbon dioxide produced in the digestion of the sludge from 10,000 m³ of sewage. Make necessary assumptions. (10)

