

Total No. of Printed Pages:2

SUBJECT CODE NO:- E-199
FACULTY OF ENGINEERING AND TECHNOLOGY
B.E.(CIVIL) Examination Nov/Dec 2017
Environmental Engineering-II
(REVISED)

[Time: Three Hours]

[Max.Marks:80]

- N.B
- Please check whether you have got the right question paper.
- 1) Question No.1 and Question No.6 are compulsory.
 - 2) Solve any two Questions from remaining in each sections.
 - 3) Figures to Right indicate full marks.
 - 4) Assume suitable data and mention it clearly.

Section A

- Q.1 a) Define: 10
- a. Sullage
 - b. Sewage
- b) What are the advantages of circular sewer section
- c) What do you understand by “Sewer appurtenances”
- d) List out various physical properties of waste water
- e) What is sludge buckling?
- f) Differentiate between organic solids and Inorganic solids.
- Q.2 a) Explain self cleaning velocity and Non – scouring velocity 07
- b) A certain district of a city has a projection population of 50,000 residing over an area of 40 hectares. Find the design discharge for sewer line for the following data. 08
- (i) Rate of Water supply = 200 Lpcd
 - (ii) Ang. impermeability factor or coefficient for entire area = 0.3
 - (iii) Time of concentration = 50 min.
- The sewer line is to be designed for a flow equivalent to W.W.F plus twice the D.W.F. Assume that 75% of water supply reaches in sewer as waste water
- Q.3 a) Explain characteristics of waste water in Detail 07
- b) Design a grit chamber for a maximum flow of 8000 m³/day to remove particles of 0.2mm dia. 08
having specific gravity of 2.65. The setting velocities of these particles is found to range from 0.018 to 0.022 m/sec. Maintain a constant flow through velocity of 0.3 m/sec. through the provision of a proportional wire.

- Q.4 a) Write design parameters for primary sedimentation tank for waste water 07
- b) A bar screen is installed in a waste water treatment plant receiving a daily peak flow of crude sewage of 50,000 m³/day. Estimate the headloss through the screen and also the gross area of the screen take desired velocity of flow through screen = 0.8 m/sec. 08

- Q.5 Write short Note (any three) 15
- (a) Screen
 - (b) Slamming tank
 - (c) Disposal of waste water.
 - (d) Nitrogen Removal

Section 'B'

- Q.6 a) Draw a flow Diagram for waste water with their functions. 05
- b) Explain unit operation and unit process 05

- Q.7 a) What is solid waste? What are the disposal techniques of solid waste? Explain any one in detail. 08
- b) Distinguish between conventional filter and high rate trickling filter 07

- Q.8 An average operating data for conventional activated sludge treatment plant is as follows. 15
- Waste water flow = 35,000 m³/day.
 Volume of aeration tank = 10,900 m³
 Influent BOD = 250 mg/ lit
 Effluent BOD=20 mg/ lit
 MLSS = 2500 mg / lit
 Effluent suspended solid = 30 mg/lit
 Waste sludge suspended solid = 9,700 mg / lit.
 Quantity of waste sludge = 220 m³/day

Determine:

- 1) Aeration period (hrs)
- 2) F/M Ratio
- 3) % Efficiency BOD removal
- 4) Sludge age (days)

- Q.9 a) Explain in detail working and design of oxidation pond. 08
- b) Explain sludge digestion process? What are factor affecting sludge digestion 07

- Q.10 Write Short Note (any three) 15
- (1) UASBR
 - (2) Aerated lagoons
 - (3) Septic tank
 - (4) Rotating Biological contractors
 - (5) Importance of Microorganism in sewage treatment