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Question Paper Code : 51262

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016

Sixth Semester

Civil Engineering

CE 2354/CE 64/10111 CE 605 – ENVIRONMENTAL ENGINEERING - II

(Regulations 2008/2010)

(Common to 10111 CE 605 – Environmental Engineering – II for B.E. (Part-Time)

Sixth Semester – Civil Engineering – Regulations 2010)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A (10 × 2 = 20 Marks)

1. What is the significance of BOD/COD ratio ?
2. How do you estimate storm runoff ?
3. Bring out difference between self-cleansing and non-scouring velocity.
4. Name any two software used for sewer design.
5. What do you mean by unit operation ?
6. What is the significance of weir loading rate in sedimentation tank design ?
7. How do you determine organic loading rate of a trickling filter ?
8. What are the objectives of secondary treatment of sewage ?
9. What is the significance of pH in anaerobic digestion ?
10. Enumerate various methods of sludge disposal.

PART – B (5 × 16 = 80 Marks)

11. (a) Explain the various sources of waste water and discuss the various physico-chemical characteristics of sewage.

OR

- (b) Discuss the environmental legislation requirements while planning sewerage system.

12. (a) Explain various systems of sanitary plumbing for buildings. Write down the main characteristics of one pipe and two pipe system.

OR

- (b) (i) Describe any four appurtenances pertaining to sewerage system. (8)

- (ii) Design a sewer to carry 17.5 L/s of ultimate peak sewage flow at half full depth. Find also the slope of the sewer. Assume $n = 0.013$. (8)

13. (a) Design a septic tank with dispersion trench for 175 users. The rate of water supply is 70 Lpcd. Assume suitable criteria as applicable. Draw a neat sketch of the unit.

OR

- (b) (i) Design a screen chamber unit for a proposed STP of 60 ML/d capacity. (10)

- (ii) Briefly discuss the operations and maintenance issues pertaining to primary treatment of sewage. (6)

14. (a) Draw the typical process flow diagram of an oxidation ditch and explain the working principle.

OR

- (b) (i) Explain the algal-bacterial symbiosis with respect to waste stabilization pond. (6)

- (ii) Design a high rate trickling filter for treating sewage of 15 ML/d with a raw sewage BOD_5 of 330 mg/L. Assume a recirculation ratio of 1.5 and efficiency of the filter as 85%. Use NRC equation. (10)

15. (a) Explain the self purification process of rivers and the various stages of oxygen sag curve.

OR

- (b) Enumerate and explain the various stages involved in sludge treatment with the help of a flow diagram.