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Question Paper Code : 31214

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Sixth Semester

Civil Engineering

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

(Regulation 2008/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Why do the analyses BOD and COD usually give different results for the same wastewater?
2. What is the effect of suspended solids on water bodies?
3. What is the significance of self cleansing velocity in sewer design?
4. Name any two softwares used in sewer design.
5. Give the design criteria for screen chamber.
6. What are the objectives of grey water harvesting?
7. What is the significance of sludge solids retention time in ASP design?
8. How do you determine hydraulic loading rate of a trickling filter?.
9. What do you mean by sewage farming?
10. What are the methods of sludge thickening?

PART B — (5 × 16 = 80 marks)

11. (a) Explain the various characteristics and composition of sewage and state their environmental significance.

Or

- (b) (i) Give the effluent standards for wastewaters disposal on land, inland water bodies and ocean. (10)
- (ii) Briefly discuss the legislation requirements for sewage treatment.(6)

12. (a) Briefly explain the various factors you will consider in the design of sewerage system. Design a sanitary sewer to serve a population of 5000 with per capita water supply rate of 110 Lpcd. Assume $n = 0.013$.

Or

- (b) (i) What is the need for ventilation in sewage pumping station? How it is provided? (6)
- (ii) Explain the configuration of manhole with a neat sketch. (10)
13. (a) (i) Design a primary settling tank unit for a peak flow of 40 ML/d in a sewage treatment plant. (8)
- (ii) Why is velocity control section provided to grit channel? Describe the different types of velocity control sections adopted for grit channel. (8)

Or

- (b) Design a septic tank with dispersion trench for 160 users. Also draw a neat sketch showing all details. Assume suitable data as applicable.
14. (a) Design an oxidation ditch for a design sewage flow of 50 ML/d. Assume suitable data wherever necessary. Draw a neat sketch of the unit.

Or

- (b) (i) Explain the algal-bacterial symbiosis with respect to waste stabilization pond. (8)
- (ii) Draw a neat sketch of UASB reactor and explain the salient features. (8)
15. (a) Explain the self purification process of rivers and the various stages of oxygen sag curve.

Or

- (b) Discuss the need for sludge dewatering and explain the various sludge dewatering methods.