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Question Paper Code: 41163

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2017

Sixth Semester

Civil Engineering

14UCE603 - WASTE WATER ENGINEERING

(Regulation 2014)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- Sewage treatment works are normally designed for a design period of
 - 40-50 years
 - 30-40 years
 - 15-20 years
 - 5-10 years
- The liquid waste originating from residential and industrial buildings, are collectively called
 - Domestic sewage
 - Combined sewage
 - Sanitary sewage
 - None of these
- The detention period adopted for grit chamber is of the order of
 - 1 minute
 - 5 minute
 - 2-4 hours
 - 12 hours
- Which of the following units work on the principle of anaerobic decomposition
 - Sedimentation tanks
 - Trickling filters
 - Sludge digestion tank
 - Activated sludge plant
- The maximum efficiency of BOD removal is achieved in
 - Oxidation ditch
 - Oxidation pond
 - Aerated lagoon
 - Trickling filter

6. Detention period in a septic is of the order of
- (a) 2-6 hours (b) 4-8 hours
(c) 12-36 hours (d) 2-4 days
7. The most common method of waste water disposal is
- (a) evaporation (b) dilution in surface water
(c) rapid infiltration (d) application for irrigation
8. Disposal of sewage for sewage farming will be most favorable, where
- (a) river runs with very low flow (b) climate is wet and rate of evaporation low
(c) area is hilly (d) all the above
9. The term sludge age is associated with
- (a) sedimentation (b) aeration
(c) sludge drying (d) filtration
10. The phenomena by which soil is clogging with sewage matter is called
- (a) sewage farming (b) sewage sickness
(c) sewage bulking (d) trickling filter

PART - B (5 x 2 = 10 Marks)

11. Classify sewage systems?
12. Write the objective of sewage treatment.
13. Define recirculation ratio.
14. Give the values of BOD and COD to discharge treated waste water into normal stream.
15. How will you prevent the sewage sickness?

PART - C (5 x 16 = 80 Marks)

16. (a) (i) What are the various sewer appurtenances used? Explain anyone with a neat sketch. (10)
- (ii) Explain the steps involved in laying of sewer under various conditions. (6)
- Or
- (b) (i) Explain the various tests carried out for sewers. (10)

(ii) What are the factors to be considered for the selection of pumps for sewage? (6)

17. (a) (i) Write short note on screening process in waste water treatment. (10)

(ii) How will you dispose the materials separated by screening? (6)

Or

(b) Design a dimension of a septic tank for a small colony of 150 persons provided with an assured water supply from municipal head works t a rate of 1 liters per person per day. Assume any other data, you may need. (16)

18. (a) Design an oxidation ditch for treating domestic sewage contributed by 10000 persons supplied with water at 200 liters per person per day. The BOD and suspended solids are 300 mg/l each. Permissible organics loading for the ditch is not less than 500 kg/ha/day. The detention period is not to exceed 6 days. assume width to length ratio as 1:2, and operational depth as 1.2 m. Assume any other data not given. Sewage volume may be taken equal to water supplied. (16)

Or

(b) Write the comparison between conventional and high rate trickling filter. (16)

19. (a) What do you understand by self purification property of a stream? Explain the factors affecting this property? (16)

Or

(b) What is sewage farming? What are the advantages over the method of disposal of sewage by dilution? (16)

20. (a) (i) Briefly explain the various stages in sludge digestion process. (10)

(ii) What are the factor affecting sludge digestion process. (6)

Or

(b) (i) Describe in detail about the sludge thickening process. (8)

(ii) Write the various disposal methods available to dispose the dewatered sludge. (8)
