

7E4033

Roll No. _____

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7E4033**B. Tech. VII Semester (Main/Back) Examination-2013****Civil Engineering****7CE3 Environmental Engineering - II****Time : 3 Hours****Maximum Marks : 80****Min. Passing Marks : 24****Instructions to Candidates:**

Attempt any **five** questions, selecting **one** question from **each** unit. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Unit - I

1. a) Define the following:
- Chemical oxygen demand.
 - Typical composition of municipal sewage
 - Standards of sewage disposal on land
 - Winkler method. (10)
- b) Explain the procedure to determine various kinds of solids present in sewage in laboratory. (6)

OR

1. a) For a waste water sample, 5-day BOD at 20°C is 375 mg/l and is 67% of ultimate BOD. What will be the 2-day BOD at 35°C? (10)
- b) What is the typical composition of domestic sewage? What are the various standards of disposal of sewage into natural watercourse and on land? (6)

Unit - II

2. a) A 500 mm diameter sewer is to flow at 0.35 depth on a grade ensuring a degree of self cleansing equivalent to that obtained at full depth at a velocity of 0.8 m/sec. Given that Manning's coefficient is = 0.013, proportionate area = 0.315, proportionate wetted perimeter = 0.472, proportionate hydraulic mean depth = 0.7705. Find the required grade, associated velocity and the rate of discharge at this depth. (10)
- b) How the storm water flow computed? Explain the rational method of design of storm water sewers. Explain clearly the relation between design rainfall intensity and time of concentration. (6)

OR

2. a) Draw a neat sketch of a typical sewage pumping station showing all components and describe in brief the functions of each component. (10)

- b) Find the relation between the sides of a square section of one sewer and diameter of circular section of another sewer when both are hydraulically equivalent (6)

Unit - III

3. a) Design an oxidation pond to treat waste water from a community of 15000 people with a B.O.D. Contribution of 45 grams/capita/day. Water is supplied at a rate of 180 liters per capita per day. Determine the detention time and also whether the effluent is suitable for irrigation if 80% B.O.D. removal is achieved.
- i) pond's L:W 4:1
 - ii) Depth of Pond = 2m
 - iii) Permissible BOD ≤ 100 mg/l for irrigation water
 - iv) Permissible BOD loading rate is 200 kg/hectare/day. (10)
- b) What is the purpose of providing septic tank? Draw a neat sketch of septic tank and explain the working of the same. (6)

OR

3. a) The sewage is flowing at the rate of 4.8 million liters/day from a primary clarifier to a standard rate trickling filter. The 5 day BOD of the influent is 180 mg/l. The value of organic loading may be taken as 200 gm/m³/day and surface loading rate as 1800 l/m²/day. Determine the volume of the filter and its depth. Also calculate the efficiency of this filter unit. (10)
- b) What do you understand by Digestion of sludge? Differentiate between anaerobic and aerobic digestion. Explain the mechanism of anaerobic digestion. (6)

Unit - IV

4. a) What is oxygen sag curve? Draw typical oxygen sag curves of the following situations:
- i) River turning septic on discharge of waste.
 - ii) River receiving domestic sewage having good dilution and flow. (10)
- b) What is the importance of providing water seal in a trap, give causes of failure of water seal and its remedial measures? (6)

OR

4. a) Draw a neat sketch of one pipe, two pipe and single stack system of plumbing. Which system is best suitable for your locality and why? (10)
- b) Draw a neat sketch of intercepting trap and explain its working. (6)

Unit - V

5. a) What are the limiting values of common air pollutants? Describe the ill effects of air pollution on human health. (10)
- b) What do you understand by Global warming? Discuss the problems of global warming on environment and on human being. (6)

OR

5. a) What are the sources of Noise pollution? What are the ways to control noise pollution at source? (10)
- b) What do you understand by Global warming? Discuss the harmful effects of global warming in the present scenario. (6)
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