

B.E. Eighth Semester (Civil Engineering) (CGS)
10230 : Environmental Engineering - II : 8 CE 02

P. Pages : 2

Time : Three Hours



AU - 2968

Max. Marks : 80

- Notes :
1. All question carry equal marks.
 2. Answer **three** question from Section A and **three** question from Section B.
 3. Due credit will be given to neatness and adequate dimensions.
 4. Assume suitable data wherever necessary.

SECTION - A

1. a) Describe with neat sketches the different types of collection systems. 6
b) Design a section of combined sewer of circular s/c from the following data : 8
 - i) Area to be served = 100 hectares
 - ii) Population = 1,50,000
 - iii) Maximum permissible flow velocity = 3 m/sec
 - iv) Time of entry for storm water = 10 min
 - v) Time of flow in channel = 20 min
 - vi) Rate of water supply = 250 lit/capita/day
 - vii) Run-off coefficient for the area = 0.45
 - viii) Hourly, maximum rain fall for the area of the design frequency = 5cmAssume any other data not given & it needed.
2. a) What are the various test for which a newly load sewer line is required to be tested ? 6
b) Design a sewer to serve a population of 35000 the daily per capita water supply being 135 lit of which 80% finds it's way to the sewer. The slope available for the sewer to be laid is 1 in 650 & the sewer should be designed to carry the four times the DWF when running fall. What would be velocity of flow in the sewer when running fall. 8
3. a) What is the purpose of preliminary treatment of sewage ? Explain how the objectives of preliminary treatment are achieved. 4
b) Design a screen chamber to treat a maximum flow of $0.15 \text{ m}^3/\text{sec}$ of domestic waste water in each channel from approach channel. 9
4. a) Differentiate between Grab & composite sewage samples. Enlist the physical & chemical examination of waste water. 6
b) Calculate 1 day 37°C BOD of sewage sample whose 5 day 20°C BOD is 100 mg/lit. Assume KD at 20°C as 0.10. 7
5. a) Explain briefly the various modified forms of activated sludge process with diagram. 6
b) Determine the size of a HRT filter for the following data : 7
 - i) Sewage flow = 5 million litres per day
 - ii) Recirculation ratio = 1.5
 - iii) BOD of raw sewage = 230 mg/lit
 - iv) BOD removal in primary settling tank = 30%
 - v) Final Effluent BOD desired = 25 mg/lit.

6. a) State & explain operation difficulties of ASP & how to overcome them. 5
- b) Design a distribution system of a circular trickling filter units for treating 5 million litres of sewage per day. The BOD of sewage is 150 mg/lit. Assume suitable data. 8

SECTION - B

7. a) What is oxidation pond ? Explain the bacterial algal symbiosis in an oxidation pond with symbiosis diagram. 6
- b) Design oxidation pond for a town of population 25000. The rate of water supply is 150 LPCD. BOD of sewage is 300 mg/lit. Assume any other data. Draw neat dimensional sketch of designed unit. 8
8. a) Explain under what circumstance the following sewage disposal methods are favourable. 6
- i) Disposal by dilution
- ii) Disposal on land
- b) Design a septic tank for a colony having 200 users & rate of water supply is 180 lit/capita/day. Assume detention time 8 hours. Draw neat sketch of plan & section of designed unit. 8
9. a) Discuss characteristics of solid waste. 7
- b) What is composting ? Enlist various factors which affect composting process. 6
10. a) What is meant by sanitary land filling ? What are the points to be considered while selecting a site for disposal of solid waste. 6
- b) Mention the factors on which quantity of solid waste generation depends. Explain the various methods of solid waste disposal. 7
11. a) Discuss the details about the effect of air pollution on human, plant & materials. 6
- b) Give the various methods of controlling air pollution. Discuss the role played by vegetation in controlling it's. 7
12. a) Describe with neat sketch the working of cyclone separators. 7
- b) What is meant by EIA ? What is its objective ? 6

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