CBCS SCHEME

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18CV55

Fifth Semester B.E. Degree Examination, Dec.2024/Jan.2025
Municipal Waste Water Engineering

Time: 3 hrs. Max. Marks: 100

Note: *1. Answer any FIVE full questions, choosing ONE full question from each module.*
2. Missing data, if any, may be suitably assumed.

Module-1

1 a. Briefly explain the different types of water carriage system with their merits and demerits. **(08 Marks)**

b. Define dry weather flow and explain the factors affecting Dry Weather Flow (DWF). **(06 Marks)**

c. A certain district of a city has a projected population of 50,000 residing over an area of 40 hectors. Find the design discharge for the sewer line for the following data :
Rate of water supply = 200 Lpcd
Average impermeability coefficient = 0.3
Time of concentration = 30 minutes
The sewer line is to be designed for a flow equivalent to wet weather flow (WWF) plus twice the DNF. Use U.S ministry of health formula. Assume that 75% of water supply reaches in sewer as wastewater. **(06 Marks)**

OR

2 a. With a neat sketch explain construction and working of manhole. **(08 Marks)**

b. Briefly explain the version tests conducted on sewer line. **(06 Marks)**

c. Briefly explain the basic principles of home drainage system. **(06 Marks)**

Module-2

3 a. Briefly explain self cleansing velocity and non-scouring velocity along with their values. **(06 Marks)**

b. Explain types of sampling and in which situations the types of sampling are used. **(06 Marks)**

c. A stoneware sewer 30 cm in diameter is laid at gradient of 1 in 100 using N = 0.013 in Manning's formula, calculate the velocity discharge and Chezy's coefficient when the sewer is running full. **(08 Marks)**

OR

4 a. With the help of general flow diagram of municipal wastewater treatment, explain the function of various units. **(08 Marks)**

b. Briefly explain the physical, chemical and biological characteristics of wastewater. **(06 Marks)**

c. Define BOD and derive an expression for first stage BOD formation. **(06 Marks)**

Module-3

5 a. Define screening and explain types of screens. **(06 Marks)**

b. With the help of neat sketch, explain the working of circular shape of settling tank. **(08 Marks)**

c. Define a primary settling tank of rectangular shape for a town having a population of 50,000 with a water supply of 180 lit per capita per day. **(06 Marks)**

OR

6 a. Briefly explain the factors affecting self purification process. **(08 Marks)**

b. Explain with a neat sketch, the salient features of oxygen sag curve. **(06 Marks)**

c. What is meant by sewage sickness and explain the preventive measures adopted to avoid the same. **(06 Marks)**

Module-4

7 a. Briefly explain suspended growth system and attached growth system of wastewater treatment with example. **(06 Marks)**

b. With the help of flow diagram, explain Activated Sludge Process (ASP) for treatment of wastewater. **(06 Marks)**

c. Mention the modification of ASP and explain any two of them. **(08 Marks)**

OR

8 a. With a neat sketch explain the working of trickling filter. **(08 Marks)**

b. Write short notes on :

i) Mechanism of anaerobic sludge digestion

ii) Oxidation ponds **(06 Marks)**

c. With the help of neat sketch, explain the working of sludge drying beds. **(06 Marks)**

Module-5

9 a. Discuss in brief biological nitrification denitrification process for the removal of nitrogen from wastewater. **(08 Marks)**

b. Explain removal of phosphorus from chemical precipitation method with equation. **(06 Marks)**

c. Explain electro coagulation method for treatment of wastewater. **(06 Marks)**

OR

10 a. With a neat sketch explain the working of septic tank. **(08 Marks)**

b. Write short notes on :

i) Eco – toilet

ii) Soak pits. **(06 Marks)**

c. Design the dimension of a septic tank for a small colony of 150 persons provided with an assured water supply of 120 Lpcd. Assume the required data suitably. **(06 Marks)**

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