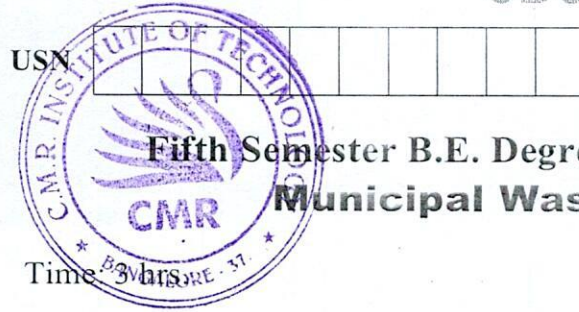


# CBCS SCHEME

18CV55



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

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 (DNF). (06 Marks)
- c. A certain district of a city has a projected population of 50,000 residing over an area of 40 hectares. 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 (06 Marks)  
ii) Oxidation ponds (06 Marks)
- c. With the help of neat sketch, explain the working of sludge drying beds. (06 Marks)

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### 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 (06 Marks)  
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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