

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

February / March 2023 Semester End Main Examinations

Programme: B.E.

Branch: Civil Engineering

Course Code: 21CV7PEIWW

Course: Industrial Wastewater Treatment

Semester: VII

Duration: 3 hrs.

Max Marks: 100

Date: 28.02.2023

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

UNIT - I

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|---|----|--|----|
| 1 | a) | State the importance of treatment of industrial wastewater | 06 |
| | b) | Explain briefly the effects of industrial wastewater on streams and sewage treatment plants. | 08 |
| | c) | Differentiate between the characteristics of domestic wastewater and industrial wastewater. | 06 |

UNIT - II

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|---|----|---|----|
| 2 | a) | Discuss stream water quality standards and effluent water quality standards. | 06 |
| | b) | Explain various types of sampling and its importance. | 06 |
| | c) | A stream, saturated with DO, has a flow of 1.2 m ³ /s, BOD of 4mg/l and rate constant of 0.3/day. It receives an effluent discharge of 0.25 m ³ /s having BOD 20mg/l, DO of 5mg/l and rate constant of 0.13/day. The average velocity of flow of the stream is 0.18m/s. Calculate the DO deficit at point 20km and 40 km downstream. Assume that the temperature is 20°C throughout and BOD is measured at 5days. Take saturation DO at 20°C as 9.17mg/l. | 08 |

UNIT - III

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|---|----|--|----|
| 3 | a) | Explain the term volume reduction with reference to industrial wastewater treatment. | 10 |
| | b) | Explain equalization of industrial wastewater | 10 |

OR

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|---|----|--|----|
| 4 | a) | Explain the term strength reduction with reference to industrial wastewater treatment. | 10 |
| | b) | Explain neutralization and proportioning of industrial wastewater. | 10 |

UNIT - IV

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|---|----|---|----|
| 5 | a) | Explain briefly various treatment methods available for inorganic solids. | 10 |
| | b) | Explain briefly various treatment methods available for organic solids. | 10 |

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

UNIT - V

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|---|---|-----------|
| 6 | a) List the advantages and Disadvantages of combined treatment. | 10 |
| | b) Explain with a typical flow diagram the manufacturing process in cane sugar industry | 10 |

OR

- 7 List out the most important four salient pollution characteristics for the following industrial liquid waste. **4x5=20**
- i) Paper and pulp mill waste
 - ii) Textile mill waste
 - iii) Dairy waste
 - iv) Distillery waste
 - v) Sugar mill waste
