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

Autonomous Institute Affiliated to VTU

February / March 2023 Semester End Main Examinations

Programme: B.E.

Semester: VII

Branch: Civil Engineering

Duration: 3 hrs.

Course Code: 21CV7PEIWW

Max Marks: 100

Course: Industrial Wastewater Treatment

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

| | | |
|---|---|----|
| 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

| | | |
|---|---|----|
| 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 $1.2 \text{ m}^3/\text{s}$, BOD of 4mg/l and rate constant of $0.3/\text{day}$. It receives an effluent discharge of $0.25 \text{ m}^3/\text{s}$ having BOD 20mg/l , DO of 5mg/l and rate constant of $0.13/\text{day}$. 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

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

OR

| | | |
|---|---|----|
| 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

| | | |
|---|--|----|
| 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

| | | |
|---|---|-----------|
| 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
