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 **PRESIDENCY UNIVERSITY**

  **Bengaluru**

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| **End - Term Examinations –JANUARY 2025** |
| **Date:** 04 - 01- 2025 **Time:**09:30 am – 12:30 pm |

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| **School:** SOE | **Program:** B.Tech CIV |
| **Course Code :** CIV3030 | **Course Name :** Industrial Wastewater Treatment |
| **Semester**: VII  | **Max Marks**: 100 | **Weightage**: 50% |

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| **CO - Levels** | **CO1** | **CO2** | **CO3** | **CO4** | **CO5** |
| **Marks** | **19** | **31** | **50** |  |  |

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Do not write anything on the question paper other than roll number.*

**Part A**

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| **Answer ALL the Questions. Each question carries 2marks. 10Q x 2M=20M** |
| **1** | Define eutrophication. | **2 Marks** | **L1** | **CO1** |
| **2** | List the four specific pollutants in stream? | **2 Marks** | **L1** | **CO1** |
| **3** | What is coagulation? | **2 Marks** | **L1** | **CO2** |
| **4** | What is the difference of aerobic and anaerobic degradation process? | **2 Marks** | **L1** | **CO2** |
| **5** | What is sludge thickening process? | **2 Marks** | **L1** | **CO2** |
| **6** | State four characteristics of textile-cotton mill wastewater. | **2 Marks** | **L1** | **CO3** |
| **7** | What are the effects of releasing distillery wastewater in stream?  | **2 Marks** | **L1** | **CO3** |
| **8** |  What is tanning process? | **2 Marks** | **L1** | **CO3** |
| **9** | How a Basic Oxygen furnace works in steel making | **2 Marks** | **L1** | **CO3** |
| **10** | What chemical process can be applied for colour removal in wastewater? | **2 Marks** | **L1** | **CO3** |

**Part B**

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| **Answer the Questions Total 80 Marks** |
| **11.** | **a** | 1. State five merits and demerits of combined treatment
2. What are the key aspects to consider in the combined treatment feasibility study?
 | **10****Marks** | **L3** | **CO2** |
| **Or** |
| **12.** | **a.** | Explain the following pre-treatment process to reduce the negative effects of industrial wastewater1. Volume Reduction
2. Equalization
 | **10****Marks** | **L3** | **CO2** |
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| **13.** | **a.** | Describe and illustrate the wastewater generation process in the tanning industry and explain the composition of combined wastewater from the tannery.  | **10****Marks** | **L3** | **CO3** |
| **Or** |
| **14.** | **a.** | Describe the origin of wastewater in the cotton textile industry and outline the characteristics of a cotton textile mill wastewater. | **10****Marks** | **L3** | **CO3** |

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| **15.** | **a.** | Describe the origin, composition, and effects of wastewater from distillery industries and treatment methods adopted to remove these pollutants. | **10****Marks** | **L3** | **CO3** |
| **Or** |
| **16.** | **a.** | Explain the key pollutants in steel industries during each production process and suggest modern treatment techniques to mitigate this pollution.  | **10****Marks** | **L3** | **CO3** |

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| **17.** | **a.** | An industrial wastewater is discharged into a river. During peak summercondition conditions, the IWW has a maximum flow rate of 17,000 m³/day, a BOD5,20 of 30 mg/L, a DO concentration of 2 mg/l, and a temperature of 25°C. Upstream from the discharge point, the river has a minimum flow of 0.75 m³/sec, a BOD5,20 of 2.5 mg/L, a DO concentration of 8 mg/L, and a temperature of 22°C. The mixing of the IWW and river water is nearly instantaneous, with a flow velocity of 0.18 m/s. The deoxygenation and reoxygenation constant at 20℃ is 0.23 and 0.4 per day respectively. The saturation DO is 8.6 mg/l. Determine the critical DO and critical time.  | **15****Marks** | **L4** | **CO1** |
| **Or** |
| **18.** | a. | 1. What is the self-purification process? Explain the actions involved in the self-purification of a stream.
2. Write five differences between industrial and domestic wastewater
 | **15****Marks** | **L3** | **CO1** |

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| **19.** | a. | Explain in detail the process of sludge treatment and disposal, including the various methods involved along with advantages and disadvantages.  | **15****Marks** | **L3** | **CO2** |
| **Or** |
| **20.** | a. | Discuss 3 treatment methods applied for removing the following pollutants in the wastewater.1. organic solids
2. inorganic dissolved solids
 | **15****Marks** | **L3** | **CO2** |

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| **21.** | a. | Illustrate the process flow diagram depicting the sources of wastewater in the Paper and Pulp Mill industry. Describe the characteristics of this wastewater, its potential impacts on water bodies if discharged untreated, and the treatment methods employed for its effective management. | **20****Marks** | **L3** | **CO3** |
| **Or** |
| **22.** | a. | Develop a process flow diagram depicting the sources of wastewater generation in a sugar mill industry. Analyze the properties of the generated wastewater and assess its environmental impacts when discharged into water bodies. Evaluate the treatment methods adopted to minimize pollution from sugar mill effluents. | **20****Marks** | **L3** | **CO3** |

**\*\*\*\*\* BEST WISHES \*\*\*\*\***