



10CV835

Third Semester B.E. Degree Examination, Dec.2019/Jan.2020

Industrial Wastewater Treatment

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1 a. Differentiate between domestic wastewater and industrial wastewater. Explain the effects of industrial wastewater on sewage treatment plants. (10 Marks)
b. List and explain the factors to be considered for stream sampling. (10 Marks)
- 2 a. With a neat sketch, explain Dissolved oxygen sag curve in stream. Also write down stream – Phelps equation along with usual notations. (10 Marks)
b. A town discharges $80\text{m}^3/\text{sec}$ of sewage into a stream having a rate of flow of $1200\text{m}^3/\text{sec}$ during lean days. The 5 day BOD of sewage at the given temperature is 250mg/L . Find the amount of critical D.O deficit and its location in the downstream portion, if the velocity of flow of stream is 0.12m/sec . Assume deoxygenation coefficient K as 0.1 and coefficient of self purification as 3.5 . Assume saturation D_o at the given temperature as 9.2 mg/L . (10 Marks)
- 3 a. Explain the strength reduction as applied to industrial wastewater. (10 Marks)
b. What are different ways the neutralization of industrial wastes is achieved? Explain. (10 Marks)
- 4 Explain briefly the following methods.
i) Sedimentation ii) Flootation iii) Ion exchange method
iv) Reverse osmosis v) Sludge drying beds. (20 Marks)

PART – B

- 5 a. What are the advantages of combined treatment of industrial wastewater with domestic wastewater? (06 Marks)
b. List the various effects of discharging raw industrial waste to the streams. Briefly explain them. (14 Marks)
- 6 a. With process flow diagram, explain the origin of waste from sugar mill. (10 Marks)
b. Explain tritely with the help of process flow diagram, the origin of waste from tannery industry. (10 Marks)
- 7 a. Explain the sources of wastes origin from a typical dairy industry. List the composition of the wastewater. (10 Marks)
b. How are the wastes from the following units in a steel plant treated :
i) Coal washery ii) Coke ovens iii) Blast Furnace iv) Scale – pit effluent. (10 Marks)
- 8 a. With a flow diagram, explain the treatment units adopted in the treatment of typical pulp and paper mill. (10 Marks)
b. Explain briefly with the help of flow diagram, the treatment of large synthetic drug plant. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, $42+8=50$, will be treated as malpractice.