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10CV835

Eighth Semester B.E. Degree Examination, June/July 2019
Industrial Wastewater Treatment

Time: 3 hrs.

Max. Marks:100

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

PART - A

- 1 a. Enumerate the effect of discharge of raw industrial wastewater into the municipal wastewater treatment plant. (10 Marks)
b. What do you understand by stream standards and effluent standards? What are the advantages and disadvantages of stream standards? (10 Marks)
- 2 a. Enumerate in brief the stream sampling programme. (04 Marks)
b. Discuss the process of self purification of rivers, with oxygen sag curve. (06 Marks)
c. A City discharges 20000 m³/day of sewage into a river whose rate of flow is 0.7m³/sec. Determine D.O deficit at 20km and critical DO deficit from the following data :

River	Sewage effluent from STP
5 day BOD at 20 ⁰ C = 3.4 mg/L	5 day BOD at 20 ⁰ C = 45 mg/L
Temperature 23 ⁰ C	Temperature 26 ⁰ C
D.O = 8.2 mg/L	D.O = 2.0 mg/L

Take R' = 0.4 , K' = 0.23 and velocity of mix as 0.25 m/sec. (10 Marks)

- 3 a. Give the classification of wastewater generated in industries. Discuss how it will help in volume reduction of industrial wastewater. (10 Marks)
b. Discuss with examples how by – product recovery helps in strength reduction of industrial wastewater generated. (10 Marks)
- 4 a. Discuss the importance of removal of dissolved organic matter from the industrial wastewater. Explain the biodegradable organics removal by activated sludge process. (10 Marks)
b. Discuss the methods adopted for treatment and disposal of sludge solids of industrial wastewater treatment. (10 Marks)

PART - B

- 5 a. What are the options of disposal of industrial wastewater? Enumerate the advantages of joint treatment of industrial and municipal wastewater treatment. (10 Marks)
b. Discuss the discharge guidelines of industrial effluents into public sewers. Give the BIS standards for the industrial effluent discharge into public sewers. (10 Marks)
- 6 a. With the help of process flow diagram, explain the sources of wastewater generated in cane sugar industries. (10 Marks)
b. Justify the need for pulp and paper industrial process wastewater recycle and reuse. Give the typical characteristics of combined wastewater. (10 Marks)
- 7 a. Write the process flow diagram indicating the sources of wastewater in a dairy industry. Give the combined wastewater characteristics of a dairy industry. (10 Marks)
b. Discuss the treatment alternatives for a fruit canning industry with the flow diagram and indicate the removal efficiency of each unit. (10 Marks)
- 8 a. Discuss the alternate treatment facilities of wastewater from a cotton textile mill, with the flow diagram. (10 Marks)
b. Write the process flow diagram of penicillium antibiotic manufacturing and indicate the sources of waste generation. Also give the composition of combined wastewater. (10 Marks)

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.