Q. Code:357166

Reg.No. | | | | | | | | | | |

B.E. / B. TECH DEGREE EXAMINATIONS, MAY 2024

Fifth &Seventh Semester

OE18307 - INDUSTRIAL WASTEWATER TREATMENT

(Regulation 2018/2018A)

TIME: 3 HOURS **MAX.MARKS: 100**

CO1 Develop an overall treatment strategy for an industrial waste stream.

CO2 Specify design criteria for physical, chemical, and biological unit operations and processes necessary to treat an industrial wastewater.

CO3 Identify industrial waste stream characteristics from several major industrial categories.

CO4 Apply different techniques and approaches for minimizing the generation and application of Physicochemical and biological treatment methods for recovery, reuse and disposal of industrial wastewater.

CO5 Identify the suitability of the use of treated wastewater for irrigation and to evaluate the optimal method for the management of wastewater.

PART- A (10x2=20Marks)
(Answer all Questions)

		CO	RBT LEVEL
1	List the sources and types of industrial wastewater.	**1**	**2**
2	Enlist the regulatory requirements for treatment of industrial wastewater.	**1**	**2**
3	Differentiate prevention and control of industrial pollution.	**2**	**2**
4	Mention the different waste minimization circles in industrial wastewater treatment.	**2**	**2**
5	Give some examples of oxidation agents used in wastewater treatment.	**3**	**2**
6	Distinguish nanofiltration and reverse osmosis.	**3**	**2**
7	Enlist the Quality requirements for wastewater reuse as prescribed by WHO.	**4**	**2**
8	Differentiate Individual and Common effluent treatment plants.	**4**	**2**
9	List the source reduction options to overcome the limitations in wastewater treatment.	**5**	**2**
10	Mention the stringent limits to be followed by Tamilnadu Pollution Control Board for wastewater generated by Pulp and Paper Industries.	**5**	**2**

PART- B (5x 14= 70Marks)

		Marks	CO	RBT LEVEL
11(a)	Discuss in detail about Industrial wastewater and environmental impacts in wastewater treatment.	**(14)**	**1**	**3**

(OR)

11(b)	**(i)**	Elaborate Industrial waste survey in wastewater treatment.	**(7)**	**1**	**3**
	(ii)	Enumerate the Toxicity of industrial effluents and Bioassay tests.	**(7)**	**1**	**3**
12(a)	**(i)**	Explain in detail about Source reduction techniques in water treatment.	**(6)**	**2**	**3**
	(ii)	Detailed discussion about Waste Audit in water treatment.	**(8)**	**2**	**3**
		(OR)			
12(b)		Explain in detail Benefits and Barriers in Industrial wastewater treatment.	**(14)**	**2**	**3**
13(a)		Elaborate the various technologies used for heavy metal removal.	**(14)**	**3**	**3**
		(OR)			
13(b)	**(i)**	Discuss in detail about Wet Air Oxidation.	**(7)**	**3**	**3**
	(ii)	Enumerate different types of membrane modules used in wastewater treatment with a neat sketch.	**(7)**	**3**	**3**
14 (a)		Elucidate Individual and Common Effluent Treatment Plants in Pharmaceutical effluent treatment.	**(14)**	**4**	**3**
		(OR)			
14(b)		Explain in detail about quantification and characteristics of sludge in primary and secondary wastewater treatment.	**(14)**	**4**	**3**
15(a)		Elaborate the wastewater treatment technologies employed to remove the Total Dissolved Solids in pharmaceutical industries.	**(14)**	**5**	**3**
		(OR)			
15(b)		With a neat sketch, explain in detail about the technologies associated in sugar industries for the removal of organic contaminants.	**(14)**	**5**	**3**

PART- C (1x 10 =10 Marks)

		Marks	CO	RBT LEVEL
16(a)	Give a detailed case study on Zero Liquid Discharge Systems (ZLD) in fertilizer wastewater treatment.	**10**	**5**	**4**

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