

Reg. No.

**MANIPAL INSTITUTE OF TECHNOLOGY****MANIPAL***(A constituent unit of MAHE, Manipal)*

II SEMESTER M. TECH (ENVIRONMENTAL ENGINEERING) END SEMESTER EXAMINATIONS

APRIL/MAY-2019

SUBJECT: INDUSTRIAL WASTEWATER TREATMENT [CIE 5222]

Date of Exam:

Time of Exam:

Max. Marks: 50

Instructions to Candidates:

❖ Answer ALL the questions

1A.	Define volume reduction. Explain in detail various methods of achieving volume reduction.	(05)	CO1
1B.	What are “Effluent Standards” and “In-stream Standards”? How are they useful in Industrial Wastewater Treatment and disposal? Explain.	(05)	CO1
2A.	What do we mean by “industrial water conservation?” Elaborate with the help of 2 specific examples.	(03)	CO2
2B.	Explain the manufacturing of sugar from cane sugar and identify the potential wastewater streams from the same industry.	(05)	CO4
2C.	List any four major methods of neutralizing both acid and alkaline wastes.	(02)	CO3
3A.	Explain in detail any four various biological methods of Tannery wastewater treatment.	(05)	CO4
3B.	What are the major methods of removing suspended solids, briefly explain any 3 methods? Would you ever use both sedimentation and flotation together? Why?	(05)	CO3
4A.	Discuss in detail any four advanced treatment options available for the treatment of Pharmaceutical wastewater	(05)	CO4
4B.	What are red category industries? Explain the wastewater treatment options for Fertilizer industry.	(05)	CO4
5A.	With the help of a flow chart explain the manufacturing of Ethanol. Also mention the pollution potential of Distillery industry.	(04)	CO3
5B.	Write a brief note on the following; i. Biomonitoring ii. Bioremediation of Industrial wastewater iii. Membrane Bio Reactor iv. Industrial Waste Survey	(04)	CO1
5C.	What are the measures to be taken during the joint treatment of Industrial wastewater with domestic sewage?	(02)	CO4