

Reg. No.

Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)



III SEMESTER M.TECH (ENVIRONMENTAL ENGINEERING)

END SEMESTER EXAMINATIONS, MAY /JUNE 2016

SUBJECT: INDUSTRIAL WASTEWATER TREATMENT [CIE 524]

REVISED CREDIT SYSTEM

Time: 3 Hours

07-05-2016

MAX. MARKS: 50

Instructions to Candidates:

- ❖ Answer any **FIVE FULL** questions.
- ❖ Write the neat flowchart/sketches wherever it is necessary

1A.	Define neutralization of industrial waste. Where is neutralization process located in treatment train? Explain its importance.	6
1B.	Discuss the behavior of conservative and non-conservative pollutants in an aquatic system.	4
2A.	Explain the manufacturing process of pulp and paper industry with the aid of a neat flow diagram.	6
2B.	How prevalent is bioremediation technique in treatment processes?	4
3A.	Discuss the essentials of pre-treatment for industrial wastewaters. List any four pre-treatment techniques that are commonly employed.	6
3B.	Explain briefly the process of volume reduction and strength reduction of industrial wastewater.	4
4A.	With the help of a flow diagram, explain in detail - the treatment of wastewater in fertilizer industry.	5
4B.	Describe the types of pollution caused by textile industry and your role as an Environmental Engineer to control it.	5
5A.	Justify through an example - "Pollution Load Allocation" is a proactive management approach.	6
5B.	Write in detail on: a) River outfalls and their impact on discharge b) Mixing Zone concept.	4
6A.	In India, there are major wine, beer and industrial alcohol producers who had set up their plants in Uttar Pradesh, Maharashtra, Tamilnadu, Madhya Pradesh and other locations in India. They mainly use molasses as a raw material for production of Alcohol. This molasses contain 7 to 8% of glucose, which is converted into alcohol through fermentation process. There is also oil separated as a by-product. The wastewater from distillery column is now called as spent wash liquor and it contains a lot of suspended and dissolved impurities mainly in the form of organic matter,	6

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	pigments, TDS and oil. Due to the presence of high impurities, it is very difficult to control the parameters as per Pollution Control Board standards by conventional wastewater treatment plant. Being an expert in industrial wastewater treatment, describe the measures that you would take to minimize these pollutants according to Central Pollution Control Board (CPCB) standards in the spent liquor before it is let out from the industry into the surface water body..	
6B.	Explain the different approaches available for the treatment of dairy wastewater	4