Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

VII SEMESTER B.TECH. (CIVIL ENGINEERING)
END SEMESTER EXAMINATIONS, NOV/DEC 2018
SUBJECT: INDUSTRIAL WASTE TREATMENT (CIE 4008)
REVISED CREDIT SYSTEM
(01/12 /2018)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer ALL the questions & missing data may be suitably assumed

1A.	Explain stream standards. What are its applications?	**03**	**CO1**
1B.	What are the sources of industrial wastewater? Discuss the effect of the following parameters on receiving water bodies. (i) Microorganisms (ii) color (iii) Heated water	**05**	**CO2**
1C.	What are priority pollutants? Mention any two priority pollutants.	**02**	**CO2**
2A.	Write a note on Hazardous waste Rule, 2008. What are its implications in industrial waste management?	**04**	**CO1**
2B.	Discuss the toxicity parameters used in bioassay test.	**03**	**CO2**
2C.	What is slug discharge? How the effect of slug discharge can be reduced?	**03**	**CO3**
3A.	What are the three major classifications of industrial wastes at an industrial plant? What are the implications of these three types of wastes?	**04**	**CO3**
3B.	Mention any two examples for (i). Byproduct recovery from industrial wastewater (ii). Process change	**03**	**CO3**
3C.	Explain the process of self-purification of stream. What are the factors helping self-purification of stream	**03**	**CO3**
4A.	Explain the manufacturing process involved in Textile industry with a neat process flow diagram	**04**	**CO4**
4B.	Tabulate the characteristics of wastewater from Tannery Industry. With the neat flow diagram explain the wastewater treatment facility for the Tannery industry.	**04**	**CO4**
4C.	What are the options to reduce the strength and volume of wastewater from the dairy industry?	**02**	**CO4**
5A.	The population of the town is 4,00,000 and the domestic sewage is 300 l/capita / day having percapita BOD of 80 g/day. The Tannery waste of the town is 3×10^6 litres/day with BOD of 5000 mg/l and waste from other industry is 2×10^6 litres /day with BOD of 1000 mg/l. An overall expansion factor of 15% is to be provided. The wastewater is discharged in the natural stream having a minimum discharge of $0.35 m^3/s$. The saturation dissolved oxygen content of 9.0 mg/l. It is necessary to maintain dissolved oxygen content of 4 mg/l in the stream. Determine the degree of treatment required to the wastewater prior to its discharge into the stream. Assume deoxygenation constant of 0.1/day and reoxygenation constant 0.3/day. Also assume temperature of natural stream and wastewater is 20°C.	**05**	**CO5**
5B.	What are the advantages and disadvantages of common effluent treatment plant?	**03**	**CO5**
5C.	Define hazardous waste. Why nuclear waste is excluded from the category of hazardous waste?	**02**	**CO5**