Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

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VI SEMESTER B.TECH. END SEMESTER EXAMINATIONS APR 2018

SUBJECT: SOLID WASTE ENGINEERING AND MANAGEMENT

PE III [CHE 4008]

REVISED CREDIT SYSTEM
(26/04/2018)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitable assumed.

1A.	Given that 100 ton/h of solid waste is applied to a rotary screen for the removal of glass prior to shredding. Determine the recovery efficiency and effectiveness of the screen based on the following experimental data: The percentage of glass in the solid waste = 10% Total weight of material in underflow = 15 ton/h Weight of glass in screen underflow = 9.1 ton/h	**05**
1B.	What are the different types of plastics used commercially? Which types of plastics contribute to recycling market and how are they recycled?	**05**
2A.	Write a short note on proximate and ultimate analyses of solid wastes.	**04**
2B.	Discuss about different solid waste collection methods with their merits and demerits.	**04**
2C.	What is the significance of calorific values in solid waste management systems? Compare the calorific value of lipids, wood and paper with cooking oil.	**02**
3A.	What are the parameters which constitutes to the hauling cost with and without transfer stations? The data for hauling cost of solid wastes for corresponding round-trip distance from source to disposal site with and without transfer stations are as follows:	**05**

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	Round-trip distance (miles) / **Hauling cost without transfer station ($)** / **Hauling cost with transfer station ($)** 0 / 0 / 10 10 / 4 / 11 20 / 8.5 / 12.5 30 / 12.5 / 14.5 40 / 17.5 / 15.5 50 / 22 / 17.5 60 / 26 / 18.5 Determine the minimum distance where the transfer station can be installed so that the overall process will be profitable.	
3B.	Discuss about various gas cleaning equipment installed in an incinerator.	**03**
3C.	What are the differences between Murf and Full stream processing? Which of these method is economically viable?	**02**
4A.	The leachate from a municipal landfill has the following characteristics: COD: 575 kg; BOD: 369 kg; Suspended solids: 125 kg; Cr^{6+}: 6 kg, NH_4-N:760 mg/L. Discuss about the physico-chemical and .biological treatment methods which can be used for the treatment of leachate with the above said properties.	**04**
4B.	Write a short note on various methods of landfilling.	**03**
4C.	Discuss about aerated state pile composting with a neat sketch.	**03**
5A.	Explain about the two-stage digesters for the production of biogas with a neat sketch.	**03**
5B.	What are the characteristics of hazardous wastes? Discuss about any four options available for the disposal of hazardous wastes by physical and chemical means.	**04**
5C.	Write a short on Integrated Waste Management (IWM). What is the significance of Life Cycle Analysis on IWM?	**03**