Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

VI SEMESTER B.TECH. (CIVIL ENGINEERING)

END SEMESTER EXAMINATIONS APRIL/MAY 2019

SUBJECT: SOLID WASTE MANAGEMENT (CIE 4025)

Date of Exam: Time of Exam: Max. Marks: **50**

Instructions to Candidates:

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

1A.	Explain the salient features of solid waste management rule 2016.	**03**	CO1
1B.	Define (i) Refuse (ii) Garbage (iii)Rubble (iii) Trash	**02**	CO2
1C.	How the solid waste are classified? Discuss any one classification in detail.	**05**	CO2
2A.	With a neat sketch explain the functional elements of solid waste.	**05**	CO2
2B.	Explain the solid waste transformation process.	**03**	CO4
2C.	Discuss any four factors affecting the solid waste composition.	**02**	C02
3A.	Solid waste from a new industrial park is to be collected in large containers, some of which will be used in conjunction with stationary compactors. Based on traffic studies at similar parks, it is estimated that the average time to drive from the garage to the first container location (t_1) and from the last container location (t_2) to the garage each day will be 15 and 20 min respectively. If the average time required to drive between containers is 6 min and the one way distance to the disposal site is 16 miles.(speed limit :55mi/h), determine the number of containers that can be emptied per day, based on an 8-h workday. Assume the off-route factor, *W*,is equal to 0.15, At -site time is 0.133h/trip haul constant a is 0.016 h/trip and b is 0.018 h/trip. Time required to pick up loaded container and to deposit empty container is 0.4 h/trip.	**04**	CO3
3B.	Which are the equipment used for compaction? Explain each in detail.	**03**	CO3
3C.	With a neat sketch explain the working of zig zag air classifier.	**03**	CO5
4A.	Explain the solid waste recycling programme.	**04**	CO5
4B.	With the neat sketch explain the components of sanitary landfill.	**03**	CO4
4C.	Enumerate the typical restriction to be observed during landfill siting.	**03**	CO4
5A.	With the neat sketch explain mass burning incinerators stating its application.	**04**	CO4
5B.	Explain the following (i) Windrow composting (ii) In- vessel composting	**03**	CO5
5C.	Explain the anaerobic processing of solid waste. Draw a neat sketch of single stage anaerobic digester.	**03**	CO5