

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION MO/2024)

CLASS: B.TECH.
BRANCH: CIVIL ENGINEERING

SEMESTER : Additional
SESSION : MO/2024

SUBJECT: CE421 SOLID WASTE MANAGEMENT

TIME: 02 HOURS

FULL MARKS: 25

INSTRUCTIONS:

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates
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Q.1(a)	State the physical and chemical properties of solid waste.	[2] 1	1
Q.1(b)	Describe the concept of integrated solid waste management.	[3] 1	1
Q.2(a)	Define transfer station.	[2] 1	1
Q.2(b)	Explain the functional elements of solid waste management.	[3] 1	1
Q.3(a)	Estimate how much time is left in a 9-hour shift for actual waste collection, if three runs are made to the disposal site each day? Given that it takes 0.2 hours to drive from garage to the beginning of the collection route, 0.3 hours to drive between the route and disposal site and 0.3 hours to return from disposal site to garage. It takes 0.2 hours to offload a truck at the site and the crew takes two 25-minute breaks per day and another 40 minutes is allowed for unexpected delays.	[2] 2	2
Q.3(b)	Using the time estimated for waste collection per day in earlier case, find how many houses would be serviced per day and how large the truck should be if it has a compaction ratio of 5:1? Assume the average distance between stops along the route is 200 ft, and pick-up truck averages 4 mph between stops. Each stop is for 04 households that each put two containers of 5 ft ³ of solid waste at the curb each week. It takes 30 seconds to empty one container. (1 mile = 5280 ft & 1 yd ³ = 27 ft ³)	[3] 2	2
Q.4(a)	Review primary and secondary collection of MSW.	[2] 2	2
Q.4(b)	Explain the process of vehicle routing.	[3] 2	2
Q.5(a)	Write the thermochemical for energy recovery from solid wastes	[2] 3	3
Q.5(b)	Examine the process of anaerobic digestion.	[3] 3	3

:::25/09/2024 M:::