

## B.Tech. DEGREE EXAMINATION, JUNE 2023

Seventh Semester

### 18CEE310T - SOLID AND HAZARDOUS WASTE MANAGEMENT

(For the candidates admitted during the academic year 2018-2019 to 2021-2022)

**Note:**

- i. **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40 minutes.
- ii. **Part - B** and **Part - C** should be answered in answer booklet.

**Time: 3 Hours**

**Max. Marks: 100**

**Part - A (20 × 1 Marks = 20 Marks)**

Answer **All** Questions

		Marks	BL	CO
1. Municipal Solid Wastes (Management and Handling) Rules India was revised in the year (A) 2012 (B) 2013 (C) 2015 (D) 2016		1	1	1
2. In order to encourage the citizens to segregate waste, municipal authority shall (A) distribute kits (B) organize awareness programs (C) keep a watch (D) avoid collection of waste		1	1	1
3. To determine the amount of waste generated in the community, both in terms of weight and volume (A) waste stream assessment (B) Field investigation (C) dynamic assessment (D) waste composition		1	1	1
4. Which of the following can be recycled many times? (A) Wood (B) Plastic (C) Aluminium (D) Organic materials		1	1	1
5. The successful waste management depends upon the level of (A) Segregation at source (B) Storage on site (C) Collection components (D) Vehicle used		1	1	2
6. Which one of the factors to consider for determination of crew size? (A) Types of container (B) Street width (C) Traffic volume (D) Labour cost		1	2	2
7. Which of the following is important in determining the biodegradability of organic waste? (A) Field capacity (B) Moisture content (C) Volatile solids content (D) Lignin content		1	1	2
8. Which of the following can be considered as source reduction? (A) Material Substitution (B) Treating Offsite (C) Analysis (D) Landfill Disposal		1	2	2
9. The containers used for contents to be transferred to collection vehicles at the site of storage are (A) Hauled containers (B) Commercial units (C) Stationary containers (D) Storage bins		1	1	3
10. ____ collection is a service provided to households, typically in urban and suburban areas (A) Alley (B) Curbside (C) Door To Door (D) Block		1	2	3

11. Which one of the following is the most expensive component of solid waste handling? (A) Collection (C) Treatment	(B) Storage (D) Separation	1	2	3
12. Small to medium transfer stations have capacities generally less than (A) 50 tonnes/day (C) 200 tonnes/day	(B) 100 tonnes/day (D) 300 tonnes/day	1	1	3
13. High Carbon: Nitrogen ratio will lead to _____ (A) Fast degradation (C) Less Carbon Utilization	(B) Fast Nitrogen Utilization (D) Less Degradation	1	1	4
14. Optimum moisture content for proper composting process is _____ (A) 50 – 60% (C) 65 – 75%	(B) 30 – 40% (D) 80 – 90%	1	2	4
15. _____ percentage of waste by weight remains after combustion (A) 10 – 20 (C) 45 – 60	(B) 20 – 35 (D) 60 – 75	1	1	4
16. Which of the following waste characteristics is considered for combustion? (A) Flash Point (C) Burning Point	(B) Energy Point (D) Melting Point	1	2	4
17. Landfill method used when terrain is unsuitable due to ground water table is _____ (A) Trench Method (C) Canyon Method	(B) Area Method (D) Hardy Method	1	2	5
18. What is the method that fills in gas into the landfills? (A) Vermi-composting (C) Incineration	(B) In-situ aeration (D) Recycling	1	2	5
19. Which of the following is not an environmental monitoring method? (A) Ground water monitoring (C) Quality of leachate	(B) Air quality assessment (D) Bio-degradation	1	1	5
20. Which of the following phases is not identified in anaerobic degradation? (A) Anaerobic phase (C) Aerobic compost	(B) Methanogenic fermentation (D) Acid fermentation	1	1	5

**Part - B (5 × 4 Marks = 20 Marks)**

Answer **any 5** Questions

21. State the responsibility of state and central pollution control board in SWMS	4	2	1
22. Define solid waste and brief about solid waste management	4	2	1
23. List out hierarchy of preferred option for solid waste management	4	3	2
24. Write the importance of a transfer station in MSWM.	4	1	3
25. Enlist the heuristic rules for routing of solid waste collection?	4	2	3
26. What are the factors affecting the composting process	4	1	4
27. Discuss about the landfill liners and covers	4	2	5

**Part - C (5 × 12 Marks = 60 Marks)**

Answer **All** Questions

28. a. Explain the various health and environmental impacts due to improper disposal of solid and hazardous waste. (OR) b. Explain in detail about source based classification of solid waste	12	2	1
29. a. Explain in detail about physical and chemical characteristics of solid waste. (OR) b. Explain in detail about source reduction of solid waste with an example	12	3	2
30. a. Explain about the different types of solid waste collection system with its neat sketch. (OR) b. Discuss about hazardous waste collection, storage and transportation in detail.	12	4	3
31. a. Explain about the thermal conversion technologies in solid waste management. (OR) b. Discuss in detail about different types of composting.	12	3	4
32. a. Discuss in detail about the various methods of solid waste disposal with its merits and demerits. (OR) b. Explain the components of landfill with a neat sketch.	12	2	5

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