

Reg. No.

B.Tech. DEGREE EXAMINATION, MAY 2022

Fifth/Sixth/ Seventh Semester

18CEO306T – MUNICIPAL SOLID WASTE MANAGEMENT*(For the candidates admitted from the academic year 2018-2019 to 2019-2020)***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 40th minute.
- (ii) **Part - B** should be answered in answer booklet.

Time: 2½ Hours

Max. Marks: 75

PART – A (25 × 1 = 25 Marks)Answer **ALL** Questions

Marks BL CO PO

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|--|---|---|---|---|
| 1. What is e-waste? | 1 | 1 | 1 | 1 |
| (A) Power generation waste | | | | |
| (B) Hospital waste | | | | |
| (C) Obsolete electronic waste | | | | |
| (D) Hazardous chemical waste | | | | |
| 2. Problem of solid waste disposal can be reduced through | 1 | 1 | 1 | 7 |
| (A) Lesser pollution | | | | |
| (B) Recycling | | | | |
| (C) More timber | | | | |
| (D) Population control | | | | |
| 3. Leachate is coloured liquid, that comes out of | 1 | 2 | 1 | 7 |
| (A) Septic tank | | | | |
| (B) Sanitary landfill | | | | |
| (C) Aerated lagoons | | | | |
| (D) Compost plants | | | | |
| 4. _____ covers entire waste analysis from source to final disposal | 1 | 2 | 1 | 7 |
| (A) Annual waste analysis | | | | |
| (B) Source of waste analysis | | | | |
| (C) Waste stream analysis | | | | |
| (D) Composition analysis | | | | |
| 5. To ensure waste do not mix up, the process adopted is | 1 | 2 | 1 | 7 |
| (A) Weekly collection | | | | |
| (B) Daily cover | | | | |
| (C) Provide transfer station | | | | |
| (D) Segregation | | | | |
| 6. _____ could recover resource and energy from waste | 1 | 1 | 2 | 2 |
| (A) Processing | | | | |
| (B) Storage | | | | |
| (C) Collection | | | | |
| (D) Transport to transfer station | | | | |
| 7. What is the MSW generation rate in large cities in India? | 1 | 2 | 2 | 7 |
| (A) 0.2 kg / capita / day | | | | |
| (B) 5 kg / capita / day | | | | |
| (C) 0.1 kg / capita / day | | | | |
| (D) 0.5 kg / capita / day | | | | |
| 8. _____ is required to convert large sized waste into smaller pieces. | 1 | 1 | 2 | 1 |
| (A) Shredding | | | | |
| (B) Compaction | | | | |
| (C) Volume reduction | | | | |
| (D) Densification | | | | |
| 9. _____ is the total amount of moisture which can be retained in a waste sample subjected to gravitational pull | 1 | 3 | 3 | 3 |
| (A) Permeability | | | | |
| (B) Field capacity | | | | |
| (C) Porosity | | | | |
| (D) Compressibility | | | | |

10. Biogas production depends upon _____ in waste. 1 2 2 7
 (A) Organic fraction (B) Field capacity
 (C) Moisture content (D) Density
11. Transfer stations are usually designed to have 1 2 3 3
 (A) 1 day storage capacity (B) 1.5 to 2 days storage capacity
 (C) 3 days storage capacity (D) 7 days storage capacity
12. In exchange waste collection method the containers used must have a minimum capacity of 1 2 3 1
 (A) 1 m³ (B) 2 m³
 (C) 4 m³ (D) 7 m³
13. In the one-way method of waste collection, waste is picked up in clear plastic or paper bags whose volume is limited to a maximum of 1 2 3 3
 (A) 110 L (B) 200 L
 (C) 90 L (D) 150 L
14. In residential areas where refuse is collected manually, _____ containers are typically required for waste storage. 1 1 3 4
 (A) Plastic or metal (B) Wooden
 (C) Masonry (D) Concrete
15. _____ technique is used to observe and estimate the movement of collection crew with the help of stop watches 1 2 3 1
 (A) Macro routing (B) Micro routing
 (C) Motion time measurement (D) Discrete
16. _____ refers to densifying waste in order to reduce their volume 1 1 4 1
 (A) Magnetic separation (B) Compaction
 (C) Screening (D) Shredding
17. In _____ the high-speed blade converts friable materials into slurry with 2.5 to 3.5 percent solid content. 1 2 4 7
 (A) Hammer mills (B) Cutters
 (C) Hydro pulper (D) Rasp mills
18. Which of the following is not a raw material in composting process? 1 1 4 1
 (A) Organic matter (B) Micro organism
 (C) Water (D) Heat
19. The physical environment in the compost process does not include factors such as 1 1 4 7
 (A) Particle size (B) pH value
 (C) Temperature (D) Mixing and pile size
20. _____ is used to reduce high quantum of weight and volume of bio-solids 1 2 4 3
 (A) Centrifugation (B) Drying beds
 (C) Lagooning (D) Incineration

21. In a leachate collection system, what is the slope of the liner? 1 2 5 77
 (A) 2-5% (B) 2-8%
 (C) 2-9% (D) 2-10%
22. Which of the following method can be used to process by using bacteria? 1 2 5 1
 (A) Incineration (B) Pellatalization
 (C) Biomethanasation (D) Shredding
23. Which is not relevant to the leachate treatment process? 1 1 5 7
 (A) Natural treatment (B) Biological treatment
 (C) Physiochemical treatment (D) Waste treatment
24. Which of the following designated to segregate wet and dry waste at source? 1 1 5 7
 (A) Municipal solid waste (B) Sewer waste
 (C) Integrated waste management (D) Leachate management
25. The liquid that collects at the bottom of a landfill is known as 1 2 5 7
 (A) Effluent (B) Leachate
 (C) Surface water (D) Runoff

PART – B (5 × 10 = 50 Marks)

Answer **ALL** Questions

- | | Marks | BL | CO | PO |
|---|-------|----|----|----|
| 26. a. Explain in detail about source based classification of solid wastes. | 10 | 2 | 1 | 7 |
| (OR) | | | | |
| b. Explain the factors affecting the SWM system. | 10 | 2 | 1 | 7 |
| 27. a. Describe about variation in waste generation and composition of waste. | 10 | 2 | 2 | 1 |
| (OR) | | | | |
| b. Explain in detail about source reduction and its purpose. | 10 | 2 | 2 | 3 |
| 28. a. Explain in detail about design consideration of transfer station and its types. | 10 | 3 | 3 | 3 |
| (OR) | | | | |
| b. Explain in detail about motion time measurement and collection vehicle routing. | 10 | 2 | 3 | 3 |
| 29. a. Explain in detail about composting. | 10 | 2 | 4 | 7 |
| (OR) | | | | |
| b. Explain in detail about air separation and magnetic separation. | 10 | 2 | 4 | 7 |
| 30. a. Explain the essential components of land filling and explain them briefly. | 10 | 2 | 5 | 7 |
| (OR) | | | | |
| b. Describe about various options for solid waste disposal and the relative merits of disposal options. | 10 | 3 | 5 | 7 |

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