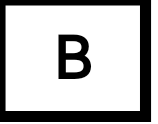
**SRM INSTITUTE OF SCIENCE AND TECHNOLOGY**

**COLLEGE OF ENGINEERING AND TECHNOLOGY**

**DEPARTMENT OF CIVIL ENGINEERING**

| **Continuous Learning Assessment** | **: CLA-3** | **Date** | **: 9.05.2023** |
| --- | --- | --- | --- |
| **Course Code & Course Name** | **: 18CEO306T Municipal Solid Waste Management** | **Duration** | **: 90 minutes** |
| **Year / Semester** | **: III/ VI** | **Maximum Marks** | **: 50** |
| **Academic year** | **: 2022 - 2023 (Even Semester)** | **Mode of Exam** | **: Offline** |

| **Course Articulation Matrix** | | | | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Learning Outcomes (CLO):** | | Engineering Knowledge | Problem Analysis | Design & Development | Analysis, Design, Research | Modern Tool Usage | Society & Culture | Environment & Sustainability | Ethics | Individual & Team Work | Communication | Project Mgt. & Finance | Life Long Learning | PSO - 1 | PSO - 2 | PSO - 3 |
| **CO-1 :** | Recognize the various sources of solid and hazardous waste | 3 | - | - | - | - | 2 | 3 | - | - | - | - | - | 3 | - | - |
| **CO-2 :** | Identify the options for Reduction, reuse and recycling of waste | 3 | - | - | - | - | 2 | 3 | - | - | - | - | - | 3 | - | - |
| **CO-3 :** | Analyze the collection and transport of solid and hazardous waste | 3 | - | - | - | - | 2 | 3 | - | - | - | - | - | 3 | - | - |
| **CO-4 :** | Recognize the various waste processing techniques | 3 | - | - | - | - | 2 | 3 | - | - | - | - | - | 3 | - | - |
| **CO-5 :** | Identify the waste disposal methods and management | 3 | - | - | - | - | 2 | 3 | - | - | - | - | - | 3 | - | - |

| **Qn. No.** | **Question** | | **Marks** | **BL** | **CO** | **PO** | **PI** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **PART A : Answer all the questions(10 × 1 = 10 Marks)** | | | | | | | |
| 1 | For Organic residential solid wastes, which of the size reduction equipment are used   1. Small grinders 2. Large grinders 3. Chippers 4. Jaw crushers | | 1 | 4 | 4 | 7 | 7.1.1 |
| 2 | The most common method of recovering ferrous scrap from the shredded solid waste by   1. Air separation 2. Hydropulper 3. Magnetic Separation 4. Screening | | 1 | 1 | 4 | 1 | 1.2.1 |
| 3 | Organic refuse begin to undergo the composting process, mesophilic bacteria proliferate, raising the temperature of composting mass upto   1. 20oC 2. 30oC 3. 35oC 4. 44oC | | 1 | 1 | 3 | 7 | 7.1.1 |
| 4 | The thermal degradation of carbonaceous material to gaseous, liquid and solid fraction in the absence of oxygen is called   1. Pyrolysis 2. Thermophilic 3. Previewing 4. Hydrolysis | | 1 | 3 | 4 | 1 | 1.2.1 |
| 5 | Which of the following Municipal solid waste has maximum moisture content   1. Leather 2. Textiles 3. Food wastes 4. Rubber | | 1 | 2 | 4 | 7 | 7.1.1 |
| 6. | The process which sterilizes and stabilizes the waste in addition to reducing its volume is called   1. Shredding 2. Previewing 3. Incineration 4. Trenching | | 1 | 3 | 5 | 1 | 1.2.1 |
| 7 | Landfilling method ideally suitable for areas where an adequate depth of cover material is available was   1. Trench method 2. Area method 3. Canyon method 4. Depression method | | 1 | 3 | 5 | 1 | 1.2.1 |
| 8 | Following are widely accepted as major components of lining system in waste containment barriers.   1. Clay soil 2. Sandy soil 3. Gravel 4. Coarse soil | | 1 | 3 | 5 | 1 | 1.2.1 |
| 9 | Thickness of geomembranes liners are in the range of   1. 1 mm to 2 mm 2. 0.5 mm to 1 mm 3. 3 mm to 5 mm 4. 6 mm to 8 mm | | 1 | 3 | 5 | 1 | 1.2.1 |
| 10 | Geonet is a plastic net like drainage blanket are in   1. planar 2. cubical 3. conical 4. spherical | | 1 | 2 | 5 | 1 | 1.3.1 |
| **PART B: Answer any four questions (4 × 4 = 16 Marks)** | | | | | | | |
| 11 | Write any four size reduction equipment’s mode of action and application. | | 4 | 1 | 4 | 6 | 6.1.1 |
| 12 | What are the benefits of composting? | | 4 | 3 | 4 | 7 | 7.1.1 |
| 13 | Write short notes on energy recovery of solid wastes. | | 4 | 1 | 4 | 6 | 6.1.1 |
| 14 | List the methods of landfilling. | | 4 | 2 | 5 | 7 | 7.1.1 |
| 15 | Write about integrated waste management. | | 4 | 2 |  | 7 | 7.1.1 |
| **PART C : Answer any one question (2 × 12 = 24 Marks)** | | | | | | | |
| 16.a | | Write in detail about the shredding equipment’s. | 12 | 3 | 4 | 6 | 6.1.1 |
|  | | **OR** |  |  |  |  |  |
| 16.b. | | Write in detail about the composting technologies. | 12 | 3 | 4 | 6 | 6.1.1 |
| 17.a. | | List out and explain the collection components of waste management system. | 12 | 2 | 5 | 7 | 7.1.2 |
|  | | **OR** |  |  |  |  |  |
| 17.b. | | Write in detail about the waste collection components and waste collection methods. | 12 | 2 | 5 | 7 | 7.1.2 |

----------------------------------------ALL THE BEST -----------------------------