Reg. No. \_\_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **14CE2039** | **Duration :** | **3hrs** |
| **Sub. Name :** | **SOLID WASTE MANAGEMENT** | **Max. Marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Explain the advantages and disadvantages of incineration method. | CO3 | 5 |
| b. | Define the hazardous waste. Describe the types of hazardous characteristics. | CO1 | 5 |
| c. | Define manifest by using neat and clean diagram. | CO3 | 5 |
| d. | Articulate the types of transport of hazardous waste. | CO2 | 5 |
| **(OR)** | | | | |
| 2. | a. | Demonstrate the classification of biomedical waste. | CO2 | 5 |
| b. | Describe handling and separation of solid waste at the source. | CO1 | 5 |
|  | c. | Define the following terms by using neat and clean diagram (if, required);  i) Types of collection systems of hazardous waste  ii) Labeling and their types | CO2 | 10 |
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| 3. | a. | Define the Integrated Solid Waste Management. Draw a suitable diagram to explain the steps involved in integrated solid waste management. | CO2 | 10 |
| b. | Explain the incineration process by using neat and clean diagram. Define the objectives of incineration process. | CO5 | 10 |
| **(OR)** | | | | |
| 4. | a. | Write short notes on (any two);  i) Dumping ii) Burial iii) Solidification and Stabilization  iv) Steps in the management of biomedical waste. | CO5 | 10 |
| b. | Explain the toxicity characteristics leaching procedure (TCLP). Explain the need of TCLP analysis and define the important factor influence toxicity. | CO3 | 10 |
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| 5. | a. | Describe in detail the factors influencing the composition of solid waste. | CO3 | 5 |
| b. | Define the importance of Integrated Solid Waste Management for human health and surrounding environment. | CO2 | 5 |
| c. | Explain the term by using neat and clean diagram (any two);  i) Solidification and stabilization ii) Need for transfer and transport  iii) Handling of hazardous waste. | CO2 | 10 |
| **(OR)** | | | | |
| 6. | a. | Describe in detail the term by using neat and clean diagram (any two);  i) Reduce, Reuse, Recycling and Recovery ii) Mannure pits  iii) Waste exchange iv) Composition of solid waste | CO2 | 10 |
|  | b. | Define the listed compositing methods by using neat and clean diagram.  i) Bangalore Method (Anaerobic method)  ii) Mechanical Method (Aerobic method) | CO2 | 10 |
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| 7. | a. | Describe in detail the following terms:  i) Source reduction of waste ii) Containers of hazardous waste  iii) Biological properties of solid waste iv) Trench method  v) Area method | CO2 | 15 |
| b. | Define the waste sampling and characterization plan. | CO4 | 5 |
| **(OR)** | | | | |
| 8. | a. | Describe the functional element of municipal solid waste management. | CO5 | 5 |
| b. | Define the terms:  i) Ramp method ii) Industrial waste  iii) Waste management hierarchy. iv) Types of solid waste. | CO3 | 10 |
| c. | Explain the physical and chemical properties of solid waste. | CO2 | 5 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Describe the salient features of solid waste management rule 2016. | CO1 | 5 |
| b. | Define hazardous waste. Write the possible strategies for hazardous waste management. | CO1 | 5 |
| c. | Explain the following term (any two);  i) Secure landfills. ii) Closure of landfills.  ii) Need of solid waste management.  iv) Role of the stack holder for solid waste management. | CO2 | 10 |