

CSWATT/July/2024

**ASSIGNMENT BOOKLET**

**CERTIFICATE IN SOLID WASTE TREATMENT TECHNIQUES  
(CSWATT)**

**Last date for submission**

**31<sup>st</sup> October**



**School of Engineering and Technology  
Indira Gandhi National Open University  
Maidan Garhi, New Delhi - 110068**

Dear Learners,

As you are aware, a weight-age of 30% has been earmarked for continuous evaluation which would consist of **Tutor Marked Assignment** for each course, BWA001, BWA002, BWA003 and BWA004 of this program. Learners are required to score minimum 40 marks out of 100 marks in assignment of each course. Submit assignment response to **Programme Coordinator (CSWATT), Block C, School of Engineering & Technology, Indira Gandhi National Open University, Maidan Garhi, New Delhi - 110068**

### **INSTRUCTIONS FOR SUBMITTING ASSIGNMENTS**

Before attempting the assignment, please read the following instructions carefully:

- 1) On top of the first page of TMA answer sheet, please write the details exactly in the following format:

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	<b>Enrolment no:</b>
	<b>Name:</b>
	<b>Address:</b>
<b>Course code:</b>	
<b>Course title:</b>	
<b>Assignment code:</b>	
<b>Study centre:</b>	<b>Date:</b>

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**Please follow the above format to facilitate evaluation and to avoid delay.**

- 2) Use full size paper for writing your answers.
- 3) Leave 4 cm margin on the left, top and bottom of your answer sheet.
- 4) Answers should be precise.
- 5) While solving problems, clearly indicate the question number along with the part being solved, if any. Recheck your work before submitting it.

**Assignments received after the due date shall not be accepted. We strongly feel that learner should retain a copy of assignment response to avoid any unforeseen situation and append, if possible.**

**Course Code:** BWA001

**Title of the Course:** Solid Wastes & Regulatory Framework

**Assignment Code:** BWA001/TMA/July/2024

**Maximum Marks:** 100

**Note: All questions are compulsory. All questions carry equal marks.**

1. What do you understand by hazardous waste? Discuss the characteristics of hazardous wastes?
2. Discuss the activities involved in the management of solid waste from the point of origin to final disposal.
3. What are the principles of integrated solid waste management? Explain.
4. Using following data evaluate the quantity of solid waste generated rate per week for a city residential area consists of 5000 homes. Given data are collected from local transfer station and observation period was one week. Assume approximately 2 adults and 1 child per home (2.5 people per home):

No. of vehicle	No. of strip	Volume (m <sup>3</sup> )	Specific weight (kg/m <sup>3</sup> )
I	15	10	280
II	20	8	210
III	25	12	320

5. What are the effects of solid waste pollution on the human health and environment?
6. Explain decentralized solid waste management in detail?
7. Using the data in Table given below, estimate the 'as discarded' density of 1000kg of typical residential waste.

Component	Percent by mass
Food Waste	15
Paper	45
Cardboard	15
Plastics	10
Wood	5
Tin Cans	10

8. Explain the significance of proximate and ultimate analysis of waste.
9. Discuss the authorizations are required for consent to establish, consent to operate and renewal under the hazardous waste management rules.
10. Discuss the authorizations required under the Plastic Waste Management rules.

**Course Code:** BWA002

**Title of the Course:** Solid Wastes Collection and Transportation

**Assignment Code:** BWA002/TMA/ July/2024

**Maximum Marks:** 100

**Note: All questions are compulsory. All questions carry equal marks.**

1. What are various components of a waste collection system?
2. Discuss the various small waste collection vehicles used in the context of developing countries.
3. Write a note on the different kinds of community waste storage systems.
4. Discuss the difference between semi-compaction vehicles and compaction vehicles.
5. Discuss the data that should be collected and updated regularly to plan collection of solid waste.
6. Explain the various types of waste transportation systems.
7. Explain about various components of investment costs for planning a solid waste management system?
8. What are the different types of revenues that can be incurred from solid waste management?
9. Explain various types of loaders used for transportation of solid waste.
10. What are the various strategies for route optimization?

**Course Code:** BWA003

**Title of the Course:** Solid Waste Processing and Treatment Techniques

**Assignment Code:** BWA003/TMA/ July/2024

**Maximum Marks:** 100

**Note: All questions are compulsory. All questions carry equal marks.**

1. Discuss the role of recovery and recycling in the solid waste management.
2. Why does it make sense to recycle the components of electronic wastes? Explain.
3. List the points to be considered in the evaluation of various options before adopting a source reduction policy.
4. Discuss the Ash handling process in detail.
5. What are the main products of Incineration Process? Describe Dioxins and Furans.
6. What is Flue Gas? Describe the process for Flue gas cleaning in brief.
7. What are osmosis and reverse osmosis process? Write the difference between osmosis and reverse osmosis.
8. How does the process of neutralization help in the treatment of hazardous waste? Explain.
9. Enlist various types of mining wastes. What are the advantages and disadvantages of mining waste?
10. What are the product(s) of does pyrolysis? Discuss the advantages and disadvantages of pyrolysis.

**Course Code:** BWA004

**Title of the Course:** Disposal of Wastes

**Assignment Code:** BWA004/TMA/ July/2024

**Maximum Marks:** 100

**Note: All questions are compulsory. All questions carry equal marks.**

1. Explain the classification of sanitary land filling based on sources of Solid waste.
2. Write a note on microbial degradation of refuse in landfills.
3. Discuss the landfill liners & Covers.
4. Write the design consideration for Landfills.
5. What are the gases components that emerge from a typical landfill and the factors that affect its production?
6. Discuss the several hazards and health issues created by landfill gases.
7. Explain the various methods for the treatment of landfill gases.
8. What is water balance method? Explain the mechanism of leachate generation with reference to water balance method.
9. Discuss the various contaminants present in leachate?
10. Explain in brief different treatment methods for leachate?