

# University of Mumbai

## Examination 2020

Examinations Commencing from 23<sup>rd</sup> December 2020 to 6<sup>th</sup> January 2021 and from 7<sup>th</sup> January 2021 to 20<sup>th</sup> January 2021

Program: CIVIL

Curriculum Scheme: Rev 2016

Examination: BE Semester VIII

Course Code: **CE-DLO 7042** and Course Name: **Solid Waste Management (DLOC)**

Time: 2-hour

Max. Marks: 80

<b>Q1.</b>	<b>Choose the correct option for following questions. All the Questions are compulsory and carry equal marks</b>
1.	Identification of Waste is an important step in _____
Option A:	<b>Waste Generation</b>
Option B:	Recycling
Option C:	Processing
Option D:	Recovering
2.	Which type of solid waste is included in Municipal Solid Waste?
Option A:	Bio-Medical Waste
Option B:	Industrial Waste
Option C:	Hazardous Waste
Option D:	<b>Commercial Waste</b>
3.	_____ is physical characteristic of Solid waste.
Option A:	Energy content
Option B:	Proximate Analysis
Option C:	<b>Field capacity</b>
Option D:	Bio-degradability
4.	_____ is chemical characteristic of Solid waste.
Option A:	Specific Weight
Option B:	<b>Proximate Analysis</b>
Option C:	Bio-degradability
Option D:	Field capacity
5.	Which type of material can be recycled many times?
Option A:	Paper
Option B:	Putrescible waste
Option C:	Wood
Option D:	<b>Aluminum</b>
6.	Why it is difficult to recycle plastics?
Option A:	It is very hard
Option B:	It comes in different sizes
Option C:	It is adhesive
Option D:	<b>It contains different types of polymer resins</b>

7.	In Curb service of collection
Option A:	<b>the homeowner is responsible for placing and returning the empty containers to their storage location</b>
Option B:	the homeowner is NOT responsible for placing and returning the empty containers to their storage location
Option C:	the homeowner is responsible ONLY for returning the containers to their storage location
Option D:	the homeowner is responsible ONLY for placing the containers to their storage location
8.	In Set-out service of collection
Option A:	the homeowner is responsible for placing and returning the empty containers to their storage location
Option B:	the homeowner is NOT responsible for placing and returning the empty containers to their storage location
Option C:	<b>the homeowner is responsible ONLY for returning the containers to their storage location</b>
Option D:	the homeowner is responsible ONLY for placing the containers to their storage location
9.	_____ is the unit operation in which collected waste materials are mechanically reduce in dimension.
Option A:	Volume Reduction
Option B:	Cutting
Option C:	<b>Size reduction</b>
Option D:	Mixing
10.	The process of burning MSW under suitable temperature and conditions in a specific furnace is called _____
Option A:	Landfill
Option B:	<b>Incineration</b>
Option C:	Recycling
Option D:	Vermi-composting
11.	Pyrolysis is the thermal processing of waste in the _____
Option A:	<b>Absence of Oxygen</b>
Option B:	Partially-Stoichiometric conditions
Option C:	Excess Air Condition
Option D:	Stoichiometric conditions
12.	Full form of PET (Plastic type)
Option A:	<b>Polyethylene terephthalate</b>
Option B:	Polyethylene tetraphthalate
Option C:	Polyethylene tri-ethelate
Option D:	Polyethylene teraphthalate
13.	A _____ system at the base and sides of the landfill which prevents migration of leachate or gas to the surrounding soil.
Option A:	Final Cover
Option B:	<b>Liner</b>
Option C:	Linear

Option D:	Monitoring
14.	Landfills for the disposal of hazardous wastes are called _____
Option A:	Open dumping
Option B:	Dumping
Option C:	<b>Secure landfills</b>
Option D:	Open landfill
15.	The liquid that collects at the bottom of a landfill is known as
Option A:	<b>Leachate</b>
Option B:	Ground water
Option C:	Moisture
Option D:	Rain water
16.	Which of the following is used in the production of Plastic?
Option A:	Mercury
Option B:	Lead
Option C:	<b>Vinyl chloride</b>
Option D:	Chlorine
17.	When can we classify waste as hazardous?
Option A:	When waste won't cause any mortality
Option B:	<b>When waste increase mortality</b>
Option C:	When waste decrease mortality
Option D:	When waste decompose itself without any aid
18.	Why chronic toxicity is difficult to determine?
Option A:	Because there is no cure for that
Option B:	Because it causes only little problems
Option C:	Because effects can be seen immediately
Option D:	<b>Because effects may not be seen for years</b>
19.	Full form of WEEE is
Option A:	Waste Electronics and electrical equipment
Option B:	Waste Equipment and Electronical Equipment
Option C:	<b>Waste Electrical and Electronic Equipment</b>
Option D:	Waste engine and electronic equipment
20.	Which type of Bio-medical waste is segregated and stored in RED coloured bag/container
Option A:	<b>Syringes (without needles), soiled gloves, catheters, IV tubes etc</b>
Option B:	All dressings, bandages, blood bags and human anatomical waste
Option C:	Glass vials, ampules, other glass ware
Option D:	Needles, sharps, blades

## Q.2

A. Solve any TWO.

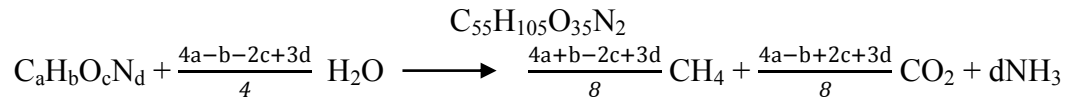
(5 Marks each)

- i. Explain hauled and stationary container system of collection with diagram?
- ii. Explain factors affecting composting process.
- iii. What are classifications of Bio-medical waste?

**B. Solve any ONE.**

**(10 Marks each)**

- i. Calculate the amount of methane gas that could be expected from anaerobic digestion having sample composition:



- ii. Calculate the energy content of the solid waste having following composition (Ash free basis):

COMPONENTS	% BY MASS	MOISTURE CONTENT
Paper	45	6
Cardboard	10	5
Plastics	10	2
Food Waste	15	20
Garden Waste	8	60
Wood	6	20
Tin Cans	6	3

**Q.3 Solve any FOUR.**

**(5 Marks each)**

- i. Explain physical chemical and biological characteristics of solid waste?
- ii. What are the factors to be considered while selecting landfill site?
- iii. Explain characteristics of hazardous waste.
- iv. Write a note on transfer station and its Economic viability.
- v. Write a note on thermal transformation of solid waste and its types.
- vi. Which types of metals can be recovered from E-waste?