

University of Mumbai
Civil Engineering Examination

Sub: CE-DLO 7042 SWM / Solid Waste Management
Year/Sem:- BE/ VII Sem
Duration: - 2Hrs

Max. Marks: 80

Q1. Attempt all the MCQS

(20 X 2 mark= 40 marks)

Q. 1. Which of the below is not an idea behind solid waste management?

- a) Control of waste generation
- b) Storage and collection
- c) Disposal
- d) Stop waste generation

Q. 2. Under which rule of Government, guidelines for solid waste management are followed today?

- a) Municipal Solid Waste Rules, 2000
- b) Municipal Solid Waste Rules, 2016
- c) Solid Waste Rules, 2000
- d) Solid Waste Rules, 2016

Q. 3. The average composition of Municipal solid waste is:

- a) 41% organic, 40% inert & 19% recyclable
- b) 20% organic, 60% inert & 20% recyclable
- c) 30% organic, 20% inert & 50% recyclable
- d) 19% organic, 41% inert & 40% recyclable

Q. 4. What is a Geo-net?

- a) A synthetic material used for drainage of liquids
- b) A synthetic material used for drainage of Gases
- c) A ceramic material used for drainage of liquids
- d) A fibrous material used for drainage of liquids

Q. 5. In a leachate collection system, what is the slope of linear?

- a) 2-5%
- b) 2-8%
- c) 2-9%
- d) 2-10%

Q. 6. In a double liner system, what is the depth and coefficient of permeability for compacted soil?

- a) 2ft and $K \leq 10^{-6}$ cm/sec
- b) 3ft and $K \leq 10^{-7}$ cm/sec

c) 2ft and $K \leq 10^{-7}$ cm/sec

d) 3ft and $K \leq 10^{-6}$ cm/sec

Q. 7. Which of the following statement regarding recycling is wrong?

a) Saves precious resources

b) Require stable market

c) Improves efficiency of treatment processes

d) Increases the needs for mining virgin materials

Q. 8. What is the most expensive component of solid waste handling?

a) Collection

b) Storage

c) Treatment

d) Separation

Q. 9. What is the process flow in a integrated solid waste management system?

a) Generation-Source separation- facility separation-collection- Transfer and transport-Landfill

b) Generation-Source separation-collection- Transfer and transport -facility separation-Landfill

c) Generation-Source separation-collection-facility separation-Transfer and transport-Landfill

d) Generation-Source separation-collection- Landfill -facility separation-Transfer and transport

Q. 10. What are the advantages of Waste to energy?

a. It is economical

b. Increase volume of waste

c. Recover useful energy

d. High degree of sophistication is required

- Q. 11. Why it is difficult to recycle plastics?
- A) It is very hard
 - B) It comes in different sizes
 - C) It is adhesive
 - D) It contains different types of polymer resins
- Q. 12. Which of the following is done on an individual level?
- A) Burning
 - B) Disposal
 - C) Recycling
 - D) Source reduction
- Q. 13. Which of the following can be recycled many times?
- A) Wood
 - B) Plastic
 - C) Aluminium
 - D) Organic Materials
- Q. 14. What plan should we make to the disposal of solid waste?
- A) Integrated waste management plan
 - B) Recycling of waste management plan
 - C) Reducing of waste management plan
 - D) Use of waste management plan
- Q. 15. Which of the following is used in the production of Plastic?
- A) Mercury
 - B) Lead
 - C) Poly Vinyl chloride
 - D) Chlorine
- Q. 16. In a leachate collection system, what is the slope of linear?
- A) 2-5%
 - B) 2-8%
 - C) 2-9%

D) 2-10%

Q. 17. In a double liner system, what is the depth and coefficient of permeability for compacted soil?

A) 2ft and $K \leq 10^{-6}$ cm/sec

B) 3ft and $K \leq 10^{-7}$ cm/sec

C) 2ft and $K \leq 10^{-7}$ cm/sec

D) 3ft and $K \leq 10^{-6}$ cm/sec

Q. 18. Dulong formula

A) Energy value (BTU/lb) = $145.4 C + 620 (H + 1/8 O) + 41S$

B) Energy value (BTU/lb) = $154.5 C + 620 (H - 1/8 O) + 41S$

C) Energy value (BTU/lb) = $145.4 C + 620 (H - 1/8 O) + 41S$

D) Energy value (BTU/lb) = $145.4 C + 620 (H - 1/6 O) + 41S$

Q. 19. During the energy recovery, The emission of _____ a direct result of the oxidation of sulphur present in solid waste

A) CO₂

B) CO

C) SO_x

D) NO_x

Q. 20. In the Landfill, the final cover shall have a barrier soil layer comprising of _____ of clay or amended soil.

A) 10 cm

B) 45 cm

C) 60 cm

D) 50 cm

Q2. Attempt any FOUR**(04 X 05 marks= 20 marks)**

1. What is E-waste? How they are managed?
2. Explain significance of chemical properties of solid waste.
3. What are the different characteristics of hazardous waste?
4. What is called as optimization of collection route?
5. Refuse Derived Fuel
6. Pyrolysis

Q3. Attempt any TWO**(02 X 10 marks= 20 marks)**

1. How would you solve solid waste problems of your locality by using Solid Waste Management System?
2. Determine the amount of air required to oxidize one tonne of waste with the chemical composition $C_{50}H_{100}O_{40}N_1$.



3. Why transfer stations are necessary? Explain any two types.
4. List the Engineering consideration involved in the implementation of 'Material Recovery Facilities'. Give the flow diagram for material recovery facilities for processing yard and other green wastes.