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**Question Paper Code: 59112**

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Elective

Civil Engineering

15UCE912- MUNICIPAL SOLID WASTE MANAGEMENT

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Which one not a residential solid waste CO1- R  
(a) Ashes                      (b) Plastics                      (c) Metals                      (d) Clothes
2. Which one not a MSWM principles CO1- R  
(a) Protection of environmental health  
(b) Promotion of environmental quality  
(c) Non generation of employment and income  
(d) Supporting the efficiency and productivity of the economy
3. The separation of waste paper, cardboard, aluminum cans, glass and plastic containers at the source is called CO2- R  
(a) On site separation                      (b) Off site separation  
(c) Water site separation                      (d) Oil site separation
4. The routes laid by municipal authorities for efficient collection from different parts of the city and disposal to the final disposal yard is called CO2- R  
(a) Primary collection                      (b) Collection routes  
(c) Collection of material                      (d) Collection of water
5. Which one not a uses of onsite waste processing CO3- R  
(a) To reduce the volume.                      (b) To recover usable materials  
(c) To increase temperature.                      (d) To alter the physical form of the solid wastes

6. Which one not a probable composition of gases in the pyrolysis of MSW CO3- R
- (a) CO (b)CO<sub>2</sub> (c) O<sub>2</sub> (d) NH<sub>3</sub>
7. Pyrolysis temperature is CO4- R
- (a) 700 °C (b) 800 °C (c) 900 °C (d) 1000 °C
8. A composting method in which the composting materials are confined within a building, container or vessel. CO4- R
- (a) Energy recovering facility. (b) Out-vessel composting.
- (c) Energy non-recovering facility (d) In-vessel composting
9. Zoning is: CO5- R
- (a) The spread of low-density urban centers
- (b) A strip of land that connects parks or neighborhoods
- (c) Trend of people moving and living in towns and cities versus the countryside.
- (d) Classification of areas for different types of development and use.
10. Leachate is CO5- R
- (a) A by-product of waste incineration
- (b) A type of waste storage container used in “clean coal” plants
- (c) A non-recyclable type of plastic
- (d) Liquid that results when garbage substances in a landfill dissolve in water

PART – B (5 x 2= 10 Marks)

11. What is meant by solid waste? CO1- R
12. List the Effects of Storage on Waste Components? CO2- R
13. How to select transfer station locations? CO3- R
14. Differentiate between aerobic and anaerobic composting of MSW. CO4- R
15. What are the Essential Components of a Landfill? CO5- R

PART – C (5 x 16= 80 Marks)

16. (a) (i) Explain various types of solid waste in detail. CO1- U (8)
- (ii) Explain the physical and chemical characteristics of MSW. CO1- U (8)

Or

- (b) State the solid waste management recommendations of expert committee 1999 considered by Honorable Supreme Court of India. State the major functions of civic body. CO1-U (16)
17. (a) Describe the factors that should be considered in evaluating onsite processing equipment. CO2-Ana (16)
- Or
- (b) Prioritize the considerations in the selection of material and capacity of storage containers. CO2- Ana (16)
18. (a) Describe the operation of hauled container system and stationary container system of waste collection. Tell how you will analyze the waste collection operation. CO3- Ana (16)
- Or
- (b) Explain the role of transfer station in solid waste management. Discuss the benefits of transfer station to a community in terms of economics, time, savings and the environmental quality? CO3- Ana (16)
19. (a) Describe the various options for the disposal of solid wastes and the relative merits of disposal options. CO4- U (16)
- Or
- (b) Outline a flow chart showing the steps involved in the aerobic composting process. Explain the factors affecting composting process. CO4- U (16)
20. (a) List the issues to be considered before deciding on gas ventilation from a landfill? Describe a typical gas vents used in the surface of a landfill for the control of landfill gas. CO5- U (16)
- Or
- (b) Explain the various phases of MSW decomposition in a closed landfill cell. Outline, how do leachate and gases differ b/w each phase? Discuss the factors which affect production of leachate & landfill gas. CO5 U (16)

