

COURSE CODE: 14M31CE115

MAX. MARKS: 25

COURSE NAME: Solid Waste Management

COURSE CREDIT: 3

MAX. TIME: 1.5 HRS

Note: Attempt all questions. Assume suitable data if required. Carrying of mobile phone during examinations will be treated as case of unfair means

1. What are the advantages and disadvantages of landfilling to incineration? (3) (CO 4)
2. What are the environmental effects of landfill? (3) (C04)
3. (a) Solid wastes from a commercial area are to be collected using a stationary- container collection system having 4 m³ containers. Determine the appropriate truck capacity for the following conditions: (CO 3)
 - (a) Container Size= 4 m³
 - (b) Container utilization Factor= 0.75
 - (c) Average number of containers at each location= 2
 - (d) Collection- Vehicle compaction ratio= 2.5
 - (e) Container Unloading Time= 0.1 h/ container
 - (f) Average drive time between container locations= 0.1 h
 - (g) One-Way Haul Distance= 30 Km
 - (h) Speed Limit= 88 Km/h (55 mi/h)
 - (i) Time from Garage to First Container Location= 0.33 h
 - (j) Time from Last Container Location to Garage = 0.25 h
 - (k) Number of Trips to Disposal Site per day= 2
 - (l) Length of Workday= 8 h; W=0.15; s= 0.1 h/trip; a= 0.016; b= 0.011 (3)
- (b) Estimate the moisture content and density of the solid waste sample from the following data: (3)

Waste Composition	% by weight	Moisture Content (%)	Typical Volume Kg/m ³
Food waste	15	70	290
Paper	45	6	85
Cardboard	10	5	50
Plastics	10	2	65
Garden Trimmings	10	60	105
Wood	7	20	240
Tin Cans	3	3	90

(CO 2)

4. Given that 1000 tonne/h of solid waste is applied to a rotary screen for the removal of glass prior to shredding, determine the recovery efficiency and effectiveness of the screen, based on the following experimental data: (CO 5)

(a) The Percentage of glass in solid waste= 8%

(b) Total Weight of material in underflow= 10 tonne/h

(c) Weight of glass in screen underflow= 7.2 tonne/h (3)

5. Define the following terms in detail: (CO 6)

(a) Pyrolysis

(b) Gasification

(c) Incineration

(d) Composting (2+2+2+2)

6. List the methods of drying? (2) (CO 5 & 6)