

4. Match List-I with List-II and select the correct answer using the codes given below the columns. CO4 [K₂]

List I	List II
A. Blue Dustbins	p. Plastics, metals and glass
B. Green dustbins	q. Waste that rot completely when buried in soil
C. Vermicomposting	r. Method of making compost
D. Red worms	s. Useful in vermicomposting

- a) A → (p); B → (q); C → (r); D → (s) b) A → (q); B → (p); C → (r); D → (s)
- c) A → (q); B → (p); C → (s); D → (r) d) A → (p); B → (q); C → (s); D → (r)
5. A residential area consisting of 1500 houses has an average of 4 residents per house. CO2 [K₃]
For estimating the quantity of solid wastes generated, the following observations were made at disposal site for a period of one week. The total quantity of wastes generated was 48650 kg/ week. Determine the unit rate of solid wastes generation.
- a) 1.90 kg/capita/day b) 1.15 kg/capita/day
- c) 1.45 kg/capita/day d) 1.65 kg/capita/day
6. What is the order of waste management hierarchy, from most to least favored? CO2 [K₂]
- a) Prevention- Recycle-Reuse- Disposal b) Prevention-Reuse-Disposal-Recycle
- c) Prevention-Disposal -Reuse-Recycle d) Prevention-Reuse-Recycle-Disposal
7. Assertion (A): Garbage contains plastics, metal containers and other wrapping CO5 [K₂]
materials.
- Reason (R): Useful and non-useful components are separated out from the garbage at landfill site after spreading the garbage over landfill site.
- a) Both A and R are true, and R is the correct explanation of A. b) Both A and R are true, but R is not the correct explanation of A.
- c) A is true but R is false d) A is false but R is true.
8. Which of the following is not a problem with landfills? CO5 [K₁]
- a) Incomplete decomposition b) Methane Production
- c) Settling d) Increasing runoff into lakes and streams

25. A landfill is to be designed to serve a population of 2 lakhs for a period of 25 years. The Solid waste (SW) generation is 2kg/person/day. The density of the un-compacted SW is 100 kg/cu.m and a compaction ratio of 4 is suggested. The ratio of compacted fill (i.e., SW + cover) to compacted SW is 1.5. Calculate the landfill volume (in million cu.m) required. 5 CO5 [K₃]
26. Illustrate the design and operation of a sanitary landfill with a neat sketch. 5 CO5 [K₂]

Answer any FOUR Questions
PART D (4 x 10 = 40 Marks)

27. Comment your opinion on current scenario of Biomedical waste management in India with a case study. 10 CO1 [K₅]
28. Estimate the moisture content, density and energy content of a solid waste sample that has the following components. 10 CO2 [K₃]

Type of waste	% by mass	Typical density	% of Moisture	Energy Content
Food waste	15	290	70	4000
Paper	45	85	6	16000
Plastic	10	65	2	32000
Garden Trimming	10	105	60	6500
Wood	5	240	20	1850
Tin Cans	5	90	3	700

29. Describe different types of collection services employed in solid waste management system. What are the methods of collecting solid waste from a community? Give an arrangement to be provided for collecting solid waste from a group of high-rise buildings. 10 CO3 [K₄]
30. Compare the various thermal processes and bring out your opinion about the best thermal process used in solid waste treatment. 10 CO4 [K₄]
31. i) Assess the key characteristics of an engineered sanitary landfill that distinguishes it from an open dump. 5 CO5 [K₅]
- ii) Discuss in detail about the post closure care required for a Municipal Solid Waste landfill (MSWLF's). 5 CO5 [K₄]
