

## INSTRUCTIONS:

1. Totally there are FIVE questions, start answering each question in a FRESH PAGE.
2. Indicate the complete question number for all the answers e.g., 1.2.(i)
3. Answer all the questions in the GIVEN ORDER only.
4. All parts of the same question should be answered IN CONTINUATION.
5. Figures in the parentheses refer to MARKS allotted to respective questions.

**1.1.** List the six criteria to be considered when selecting a new vehicle for waste collection and transport. (3)

**1.2.** (i) Calculate the LCV of the MSW generated in a city which has the following composition of waste: (3)

Paper: 25%, textile: 4%, woods & leaves: 10%, food waste: 20%, plastic & rubber: 8%, and water – 33%. (4)

**1.3.** From the data provided in the following table, calculate the daily per capita municipal solid waste generated from a community. (5)

House No	No of persons in each house	Total municipal solid waste generated (kg)						
		Days						
		1	2	3	4	5	6	7
<b>1</b>	<b>7</b>	<b>6.5</b>	<b>6</b>	<b>5.75</b>	<b>7</b>	<b>4.5</b>	<b>6</b>	<b>5.9</b>
<b>2</b>	<b>6</b>	<b>7</b>	<b>7.25</b>	<b>8</b>	<b>7.5</b>	<b>7.4</b>	<b>7.25</b>	<b>7.4</b>
<b>3</b>	<b>9</b>	<b>10</b>	<b>10.1</b>	<b>9.8</b>	<b>9.5</b>	<b>10.5</b>	<b>10.1</b>	<b>10.2</b>
<b>4</b>	<b>7</b>	<b>2.9</b>	<b>2.8</b>	<b>2.7</b>	<b>2.6</b>	<b>2.3</b>	<b>2</b>	<b>2.5</b>
<b>5</b>	<b>5</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>3</b>	<b>4.2</b>	<b>4</b>	<b>6</b>
<b>6</b>	<b>6</b>	<b>6</b>	<b>6.2</b>	<b>7</b>	<b>6.6</b>	<b>5</b>	<b>6</b>	<b>6.5</b>

**2.1.** List any eight steps to be followed for efficient waste collection and transport? (4)

**2.2.** Define CWIS and list its principles. (2+3)

**2.3.** Calculate the OLR of a reactor with a volume of 25m<sup>3</sup>. The organic waste has 40% VS, and 1500 Kg of the waste has to be fed to the digester daily. (3)

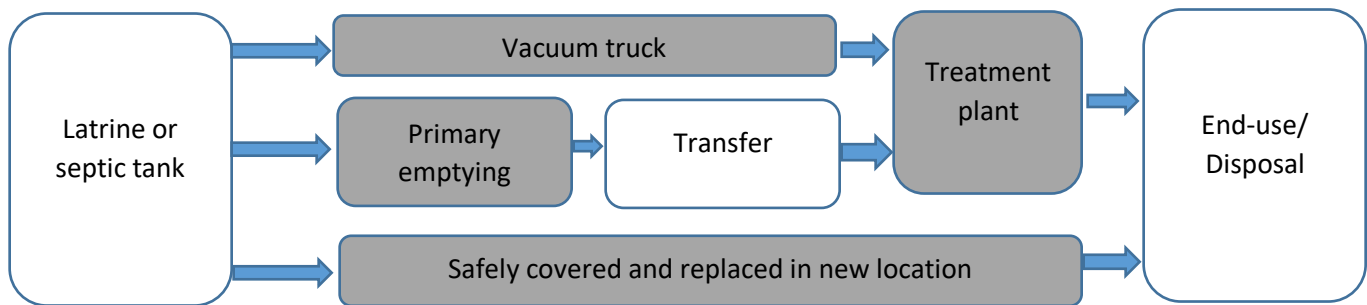
**3.1.** List the steps involved in reducing the contamination level of any waste? (4)

**3.2.** What challenges are faced by low- and middle-income countries for construction and demolition waste management? (4)

**3.3.** How is a strategic MSWM plan prepared? (4)

**4.1.** Of the steps involved in planning local-level sanitation systems, list the steps where the input/involvement of the community is required. Briefly explain the steps. (5)

**4.2.** Given below is the schematic of service chains in sanitation systems non-networked sanitation systems. Briefly explain the need for the steps highlighted in the service chain based. (4)



**4.3.** From the scenario mentioned below, select the appropriate constructed wetland for treating wastewater from BITS Pilani, Hyderabad Campus. Name the treatment system and justify the answer.

Scenario: Effluent from the primary wastewater treatment system has adequate solids content, which has to be treated, and well-trained manpower and uninterrupted power supply are provided. (3)

**5.1.** What is the purpose of establishing ISSDP, and what are its outputs? (2+2)

**5.2.** Anaerobic baffled reactor is used for faecal sludge treatment. However, there are problems with high HRT, low SRT and lower solids removal. What changes are to be made in the existing system, and what are the advantages of such a system? (2+3)

**5.3.** During the wastewater treatment system using aerobic stabilization ponds, how are the aerobic conditions maintained? (3)