

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 in order, the eight steps of selecting organic solid waste treatment technologies? **(4)**

1.2. What are the attributes or performance measures of the following objectives of solid biowaste treatment technologies: **(i)** High job creation; **(ii)** Low emission generation; **(iii)** High treatment capacity and **(iv)** High technical reliability. **(4)**

1.3. What are the **(i)** three main objectives and any **(ii)** two methods of mixed solid waste treatment? **(3+1)**

2.1. Typically, **(i)** what percentage of expenditure on solid waste management is spent on MSW collection and transport in low-income settings, and **(ii)** what are the problems associated with this process? **(1+3)**

2.2. Based on 2010 waste generation data and according to the projection of waste generation (million tons/day) in 2025, **(i)** which income group of countries are expected to generate high quantities of waste and **(ii)** why? **(2+2)**

2.3. Explain how waste collection is split in cities with variety of neighborhoods/ human settlements (slums, high-traffic roads, mountain slopes, etc.). **(4)**

3.1. What are the predominant activities of informal sector waste workers in MSW management in developing countries? **(3)**

3.2. Brief about the SWACH cooperative in Pune including its scope. **(2+1)**

3.3. **(i)** What is black carbon? **(ii)** Establish its relation with MSW. **(2+1)**

3.4. What are the three different plastic (waste) management strategies? **(3)**

4.1. **(i)** What is the purpose of primary treatment in a wastewater treatment plant? **(ii)** What are the unit process that are typically used in primary treatment. **(2+2)**

4.2. **(i)** How can the solid-liquid separation process be improved in a septic tank? **(ii)** Can septic tank be considered as a comprehensive treatment system? Justify. **(2+2)**

4.3. **(i)** Draw the schematic of an Imhoff tank, **(ii)** list any two of its advantages over sedimentation tank. **(2+2)**

5.1. Brief the working principle of Fossa Alterna. **(4)**

5.2. Give any **(i)** two advantages and **(ii)** two disadvantages of twin pits for pour flush system. **(2+2)**

5.3. **(i)** What are the two main design considerations of the Erdos project? **(ii)** What are the onsite treatment methods used for greywater and feces treatment? **(2+2)**