Total number of printed pages:3 **PG/1st/PGET1109**

2021

WASTE TO ENERGY CONVERSION

Full Marks: 100

Time: Three hours

The figures in the margin indicate full marks for the questions.

Answer any five questions.

1. a) Define the following: 5 x 2 = 10

   i) Incineration

   ii) Thermochemical conversion

   iii) Leachate

   iv) Aerobic composting

   v) Vermicomposting

   b) How is energy recovery from landfill gas done? Draw the schematic diagram of a landfill gas energy recovery scheme. 10

2. a) Explain how the life cycle analysis of materials recycling is done? 5

   b) How is anaerobic digestion in a controlled system different from anaerobic digestion in landfills? 5

c) What is gasification? What are the different types of waste gasifier reactor system? 5

d) Briefly explain the different treatment and disposal options for hazardous wastes. 5

3. a) How is municipal solid waste treated and disposed? Mention few methods. 5

b) Explain the process of reduction, re-use and recycling of wastes that can contribute on the sustainable development. 5

c) Draw the schematic diagram of Mechanical-Biological Treatment (MBT) process and explain it. 10

4. a) What is composting? Explain the process of composting. 5

b) Write a short note on the current scenario of municipal solid waste generation in India. 5

c) With the help of a diagram explain the liquid and gaseous waste incinerators. 10

5. a) With an example explain the process of municipal solid waste recycling. 5

b) What is pyrolysis? Explain how pyrolysis process works. 5

c) Explain briefly the different considerations to be made for landfill site selection. 10

6. a) Explain the major stages of non-hazardous waste degradation in landfills. 10

b) Draw the schematic diagram of the anaerobic digestion process for biodegradable waste and explain the process. 10