

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. IST Semester–Remedial Examination – July- 2011

Subject code: 711803N

Subject Name: Municipal and Hazardous Solid Waste Management

Date: 11/07/2011

Time: 10:30 am – 01:00 pm

Total Marks: 70

Instructions:

- 1. Attempt all questions.**
- 2. Make suitable assumptions wherever necessary.**
- 3. Figures to the right indicate full marks.**

Q.1 (a) Which are the methods used to estimate waste quantities Describe the material mass balance method in detail. **07**

(b) Write a short note on ‘Landfill Gas Management’. **07**

Q.2 (a) What is the need of transfer and transport in the management of municipal solid waste? Enlist the various types of transfer station and explain any one in detail. **07**

(b) Write a short note on “Application of GIS in locating a landfill”. **07**

OR

(b) Enlist and explain the factors affecting the waste generation rates. **07**

Q.3 (a) Explain the following terms with reference to processing of municipal solid waste: **07**

(i) Crushing

(ii) Sorting

(iii) Incineration

(b) Draw the flow diagram for rear end system for processing and recovery of solid waste and explain it in detail. **07**

OR

Q.3 (a) Enlist the factors which should be considered for selection of site for disposal of solid waste and explain any two in detail. **07**

(b) Solve the following problem using graphical method: **07**

$$\text{Max } z = 3x_1 + 4x_2$$

subject to constraints

$$4x_1 + 2x_2 \leq 80$$

$$2x_1 + 5x_2 \leq 180$$

Where x_1 and $x_2 \geq 0$.

Q.4 (a) Explain knock off criteria for site selection of landfills. **07**

(b) Enlist various reagents and chemicals for stabilization and solidification of hazardous waste and explain its working mechanisms with sketch. **07**

OR

- Q.4 (a)** Name various physic-chemical; treatment technologies for hazardous waste and explain any two in detail. **07**
- (b)** Explain single and double liner system for secured landfill with sketches. **07**
- Q.5 (a)** What is biomedical waste ?Explain storage of biomedical waste in detail. **07**
- (b)** Distinguish between aerobic and an aerobic composting. **07**
- OR**
- Q.5 (a)** Define hazardous waste. List various categories of hazardous waste and explain any two in detail. **07**
- (b)** Explain recycling of hazardous waste with suitable example. **07**
