

GUJARAT TECHNOLOGICAL UNIVERSITY**M. E. - SEMESTER – II • EXAMINATION – SUMMER • 2013****Subject code: 1723005****Date: 05-06-2013****Subject Name: Environment and Safety Management****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)** A sanitary landfill is being designed to handle solid waste generated by Venkatapur town having a population of 1,00,000. The waste generation on the average is 0.3 kg/person/day. It is expected that the waste will be delivered by a truck to the landfill site on a 4 day/week basis. The mean density of the refuse spread is 100 kg/m³. The solid waste is spread in 1.5 m layers and compacted to 0.3 m. The landfill will use 0.15 m of soil for daily cover. An intermediate cover of soil of 0.2 m is used to complete the cell and a final cover 1.0 m over the stack of 2 cells is recommended. Calculate the following: **1.** Annual volume required for the landfill. **07**
2. Annual horizontal area covered by the solid waste.
- (b)** Discuss the construction and working of thermal incinerator with its advantages and disadvantages. **07**
- Q.2 (a)** What is e-waste? Give types of e-waste. List out various methods for e-waste treatment and disposal and explain any one in detail. **07**
- (b)** Explain hydrometallurgical treatment process for recovery of metals from waste PCBs using conventional leachants with a neat sketch. **OR 07**
- (b)** Discuss the method of determining emissions of sulfur dioxide from stationary sources (EPA method 6). **07**
- Q.3 (a)** Discuss the selection criteria for storage and handling of hazardous material in underground tanks. **07**
- (b)** What are the safety rules for transportation of hazardous material? Explain any one transportation route in brief. **07**
- OR**
- Q.3 (a)** What are pressure relief devices? Explain working of rupture disk with the help of neat sketch. **07**
- (b)** List out the applications and performance characteristics of horizontal blow-down drum, cyclone separator and quench tank for emergency relief device effluent collection. **07**
- Q.4 (a)** What is exempted in SMPV rules? What are the special precautions to be taken against accidents during repair in SMPV rules? **07**
- (b)** List out the steps for design of a gas incinerator. **07**
- OR**
- Q.4 (a)** What are flame arresters? Discuss the basic principle, uses and applications of flame arresters. **07**
- (b)** List out and explain the selection criteria of flame arresters. **07**
- Q.5 (a)** What is included in Pre-Audit activities and how it is carried out? **07**
- (b)** Explain Environment Audit methodology. **07**
- OR**
- Q.5 (a)** List out the steps for design of an interlock system for liquid samples. **07**
- (b)** What is the role of pollution detector equipment in industry? Explain principle and working of any one with a neat sketch. **07**
