

**NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF INDUSTRIAL TECHNOLOGY
BACHELOR OF ENGINEERING (HONS) DEGREE
DEPARTMENT OF CIVIL AND WATER ENGINEERING
PART V SUPPLEMENTARY EXAMINATIONS- AUGUST 2014**

SOLID WASTE MANAGEMENT –TCW 5006

Instructions:

Answer any four (4) questions

Total marks: 100

Time: 3 hours

QUESTION 1

- a. Discuss with illustrations, the variation in the generation of different constituents of landfill gas. Show the typical composition of landfill gas (15marks)
- b. Discuss the factors affecting quantity and quality of leachate (10 marks)

QUESTION 2

Outline the techniques used in achieving impact prediction and assessment in EIA. (25 marks)

QUESTION 3

- a. Define the following terms as used in municipal solid waste management.
 - i. cell
 - ii. lift
 - iii. leachate
 - iv. breakthrough time
 - v. landfill (10 marks)
- b. Make comparison of Geosynthetic Clay Liner (GCL) and Compacted Clay Liner (CCL) (15 marks)

QUESTION 4

- a. Describe the “3Rs” with reference to solid waste management and sustainable development. (10 marks)
- b. Explain the different sources and types of solid waste in an urban environment (15 marks)

QUESTION 5

- a. List and describe the factors that must be addressed in developing a design and an operational plan for a landfill (15 marks)
- b. Draw a neat labeled diagram of a modern municipal landfill indicating various components of it. (10 marks)