NOTES:

1. There are a total TWENTY-TWO (22) examination questions on 2 pages.

2. Each question is of the value indicated. There are 100 possible marks for the examination.

3. This is a CLOSED BOOK EXAM.

4. Candidates are permitted ONE (1) letter sized aid sheet (8.5 "x 11") both sides.

5. No calculator allowed.

6. If doubt exists as to the interpretation of any question, the candidate is urged to submit with the answer paper, a clear statement of any assumptions made for the solution of the examination questions.

7. Clarity and organization of the answers are important.
Define

5  1.1 Municipal solid waste management
1.2 Sustainability
1.3 Vermicomposting
1.4 Life-cycle analysis
1.5 Soil porosity

3  2. Name 3 obstacles to solid waste recycling.

3  3. Name 3 Federal Acts that are relevant to waste management.

3  4. What are some of the site features to look for in a sanitary landfill – name 3

3  5. Name 3 strategies you would examine for the management of food wastes

5  6. Why is risk perception important? How can you manage it?

5  7. Outline in point form how you would conduct an assessment of options to extend the lifespan of an existing landfill.

6  8. You have been asked to investigate a composting operation which is emitting an odour. Outline in point form the steps you would take to resolve this problem.

20  9. A community of 50,000 permanent residents has commissioned your company to arrive at a solution for managing additional solid waste generated by an international winter sporting event lasting 3 weeks. How would you approach this challenge? Outline your approach in point form as you would for the main and sub-headings in a report.

3  10. Identify the prerequisites to the biological process of composting.

6  11. What factors affect the composting process and state the reason why.

4  12. If solid wastes are to be used as a fuel, what are the 4 most important properties that must you must know?

5  13. What factors are important in the design of a landfill leachate collection system?

7  14. In siting a new landfill, what are the important considerations?

2  15. Why is knowing the hydraulic conductivity of compacted wastes important?

77  Sub-total
16. In order to assess the leachate formation in a landfill draw a definition sketch for a water balance.

17. Identify 4 landfill leachate management options.

18. Identify how you could maintain an outdoor composting facility during winter.

19. What is the most effective way to eliminate the small quantities of hazardous wastes now found in municipal solid waste?

20. Identify 3 commonly used methods to assess solid waste quantities.

21. What are 2 strategies that allow you to derive energy from municipal wastes?

22. Name 3 commonly used unit operations and facilities for the separation and processing of separated and co-mingled municipal solid wastes.

100 TOTAL