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Courses » Geoenvironmental Engineering (Environmental Geotechnology); Landfills, Slurry Ponds &

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# Unit 7 - Week 6

## Course outline

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Lecture 18: Stability of Slopes - Part 1

Lesson 19: Stability of Slopes- Part 2

Lesson 20 : Stability of Slopes- Part 3

Lecture 21: Settlement of Landfills

Quiz : Assignment no. 6

Assignment 6 solution

Week 7

## Assignment no. 6

The due date for submitting this assignment has passed.

As per our records you have not submitted this assignment. **Due on 2018-09-12, 23:59 IST.**

1) In wet waste, minimum acceptable factor of safety for permanent slope and temporary slope is \_\_\_\_\_ and \_\_\_\_\_ respectively. **1 point**

- 1.5 and 1.3
- 1.3 and 1.5
- 1 and 1.5
- 1.5 and 1

**No, the answer is incorrect.**  
**Score: 0**

**Accepted Answers:**  
*1.5 and 1.3*

2) Veneer reinforcement is generally anchored at: **1 point**

- Ground level
- Berm level
- Along slope
- At the toe

**No, the answer is incorrect.**  
**Score: 0**

**Accepted Answers:**  
*Berm level*

3) Secondary settlement in landfills is due to: **1 point**

- Compression of air

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*Decomposition and Degradation*

4) What is the role of passive wedge in stability of cover slopes of landfills?

**1 point**

- Increase shear strength
- To reduce stability
- To improve stability
- No effect

**No, the answer is incorrect.****Score: 0****Accepted Answers:***To improve stability*

5) A landfill 50 m X 150 m is operated in three annual phases. Each phase is 50 m X 50 m in plan and 10 m high and is capped at the end of the year. Each new phase is started adjacent to the previous phase. Annual rainfall of the region is 600 mm/year. Annual waste placement is 8000 tons. Active phase infiltration is 70% and capped phase infiltration is 20%. The landfill is approaching the end of third year of operation since it started receiving waste. Compute the leachate generated (in m<sup>3</sup>) in the third year of operation from the entire area covered by waste.

**0 points**

- 3500
- 4050
- 10500
- 1500

**No, the answer is incorrect.****Score: 0****Accepted Answers:***4050*

6) Compute the primary settlement of the top of the landfill 9 m high at the end of the construction. Neglect settlement of the base of the landfill.

**1 point**Modified primary compression index,  $C_c' = 0.5$ ;Unit weight of waste,  $\gamma_t = 12 \text{ kN/m}^2$ ;Initially applied pressure in the waste layer (compaction pressure),  $s_0 = 24 \text{ kN/m}^2$ 

Analyse in 3 layers.

- 2.53 m
- 0.57 m
- 3.58 m
- 1.39 m

**No, the answer is incorrect.****Score: 0****Accepted Answers:***1.39 m*

7) Estimate the land area required for an above ground MSW landfill which is receiving an average of 80 tons per day of waste from the year 2018 for next 10 years. The total height of the landfill is restricted to 12 m including liner and cover systems. The placement density is 1.4 tons/m<sup>3</sup>. The total thickness of daily covers (for entire period of operation) is estimated to be 1.4 m.

**1 point**

- 14500
- 18400
- 26400

62000

No, the answer is incorrect.

Score: 0

Accepted Answers:

26400

8) The side slope of a landfill cover is 20 m long and has an inclination of 3:1 (H: V). It **1 point** comprises of a 0.6 m thick top soil and 0.3 m thick sand drainage layer overlying a geomembrane. The geomembrane (GM) has compacted clay beneath it. Compute the tension in geomembrane (neglect weight of geomembrane; unit weight of top soil and drainage layer,  $\gamma$  is 16 kN/m<sup>3</sup>, angle of interface shearing resistance between sand & geomembrane is 24°, between clay & geomembrane is 14°; adhesion is negligible).

23 kN/m

14 kN/m

37 kN/m

42 kN/m

No, the answer is incorrect.

Score: 0

Accepted Answers:

23 kN/m

9) Approximately 2000 tons per day of waste is generated by city A. The waste which is **1 point** separable is sent to various processing facilities. Waste reaching C&D processing plant, thermal processing plant (WtE plant) and composting facility is 450 tons, 600 tons and 400 tons respectively. Rejects from each of the processing facilities is estimated to be 20%. The rejects from the above processing facilities and the intricately mixed waste which is not being sent to any processing facility is sent to the MSW landfill. Indicate, in tons per day, quantity of total material reaching landfill. Please tick the answer closest to your result.

680

540

1100

840

No, the answer is incorrect.

Score: 0

Accepted Answers:

840

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