Assignment 6

This is the last assignment for the topic Geosynthetics and Reinforced Soil Structures. Due on 2020-03-11, 23:59 IST.

1. An infinite soil slope consists of a dry granular soil having friction angle of 35°. The slope angle is estimated to be 45°. What is the factor of safety? 1 point
   Answer: 0.77

2. What is the factor of safety of the above slope (i Question 1) during continuous rain when the water flows along the surface? 1 point
   Answer: 0.89

3. An infinite soil slope of in height and 90° slope angle consists of soil having properties of c = 25 kN/m², d = 29 kN/m³ and unit weight of 20 kN/m³. What is the factor of safety of the slope? 1 point
   Answer: 2.09

4. What are the different surface treatments used to protect the slope surfaces? 1 point
   Vegetation, norri, rock face cementing, stone coated galvanized basing
   All of the above
   Answer: All of the above

5. A rigid embankment with slope angle of 70° is made up of clay soil with c = 30 kN/m² and d = 19 kN/m³. The unit weight of the soil is 16 kN/m³. The failure of the slope occurred at a point 0.5 m above the base. The weight of the embankment is 400 kN/m². What is the factor of safety of the slope? 1 point
   Answer: 1.25

6. In the above problem, a flexible soil reinforcement layer capable of providing 450 kN/m² of tensile force is provided. Assume that this sufficiently long length of reinforcement is provided. What is the factor of safety of the reinforced embankment? 1 point
   Answer: 1.5

7. What should be the minimum tensile force to be provided by a rigid soil reinforcement to increase the factor of safety to 1.2 in problem No. 6? 1 point
   Answer: 225 kN/m²

8. In the above problem, it is required to design the reinforcement for a deep embankment resting on a competent soil. The height of the slope is 10 m and constructed with a slope angle of 30°. The properties of the soil are c = 10 kN/m² and d = 20 kN/m³. A uniform exchange of 25 MPA acts on top of the slope. What is the total resistance force to be provided by the reinforcement layers to increase the factor of safety to 1.4. Perform the analysis by using wedge method. 1 point
   Answer: 700 kN/m²

9. In the above problem, what is the maximum sliding force at the base of the slope? 1 point
   Answer: 450 kN/m²

10. In the above problem, what is the factor of safety of the slope if the total tensile force provided by the reinforcement layers is only 250 kN/m²? 1 point
    Answer: 1.15

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