

## Unit 4 - Week 2

## Course outline

How does an NPTEL online course work?

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Week 2

● Strength Analysis of Reinforced Soils - I

● Strength Analysis of Reinforced Soils - II

● Testing of Geosynthetics - I

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## Assignment 2

The due date for submitting this assignment has passed.  
As per our records you have not submitted this assignment.

Due on 2020-02-12, 23:59 IST.

1) What is the minimum height to diameter ratio of a soil sample in triaxial compression tests?

1 point

- 1  
 3  
 2  
 Any ratio

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
2

2) What is the expression of deviator stress in triaxial compression tests?

1 point

- $(\sigma_1 - \sigma_3)/2$   
  
 $\sigma_1 - \sigma_3$   
  
 $\sigma_1 + \sigma_3$   
  
 $(\sigma_1 + \sigma_3)/2$

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
 $\sigma_1 - \sigma_3$

3) A soil having shear strength properties of  $c=10$  kPa,  $\phi = 30^\circ$  is tested in triaxial compression at a confining pressure of 100 kPa. What is the limiting deviator stress?

1 point

- 100 kPa  
 93.33 kPa  
 334.64 kPa  
 234.64 kPa

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
234.64 kPa

4) Some factors that affect the strength of reinforced soil are,

1 point

- Friction angle of soil  
 Interaction between soil and reinforcement  
 Strength of the reinforcement  
 Grain size distribution of the soil

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Friction angle of soil  
Interaction between soil and reinforcement  
Strength of the reinforcement  
Grain size distribution of the soil

5) At low deviator stresses, the modulus of reinforced soil as compared to that of unreinforced soil will be,

1 point

- Higher  
 Lower  
 Same  
 Difficult to say

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Same

6) The reinforcement is likely to rupture under the following conditions,

1 point

- Pure compression loads,  
 High confining pressures  
 Low tensile strength of reinforcement  
 Highly angular soils

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
High confining pressures  
Low tensile strength of reinforcement

7) For a given reinforcement, the influence of reinforcement on the strength of reinforced soil reduces under the following conditions,

1 point

- As the confining pressures decreases  
 As the confining pressures increases  
 As the spacing between the reinforcement layers increase  
 As the fines content of the soil increases

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
As the confining pressures increases  
As the spacing between the reinforcement layers increase  
As the fines content of the soil increases

8) What is the pullout capacity of a reinforcement layer of width 0.5 m and length 5 m buried in a granular soil having friction angle of  $35^\circ$ . The interface friction angle is  $28^\circ$  and the normal pressure at reinforcement level is 100 kPa.

1 point

- 132.9 kN  
 265.9 kN  
 350.1 kN  
 299.3 kN

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
265.9 kN

9) A reinforced dry granular soil sample has failed at a deviator stress of 250 kPa when tested at a confining pressure of 100 kPa. What is the friction angle of the reinforced soil?

1 point

- 33.8°  
  
 58.1°  
  
 61.9°  
  
 25.4°

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
33.8°

10) The additional confining pressure generated by reinforcement layer in a dry granular soil is 60 kPa. If the friction angle of the unreinforced soil is  $33^\circ$ , what is the apparent cohesion in the reinforced soil?

1 point

- 55.3 kPa  
 101.8 kPa  
 110.6 kPa  
 89.4 kPa

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
55.3 kPa

11) For a given reinforcement layout, the friction angle of the reinforced soil increases when

1 point

- Larger interaction factors  
 Higher strength of reinforcement layers  
 Larger friction angles of the soil  
 At higher confining pressures

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Larger interaction factors  
Higher strength of reinforcement layers  
Larger friction angles of the soil

12) Some of the physical properties of geotextiles are

1 point

- Thickness  
 Puncture strength  
 Mass per unit area  
 Compressibility

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Thickness  
Mass per unit area

13) Which of the following geotextiles has the least compressibility?

1 point

- Nonwoven needle punched geotextile  
 Woven geotextile  
 Nonwoven heat bonded geotextile  
 Nonwoven resin bonded geotextile

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Woven geotextile

14) Which of the following strengths can be determined using ASTM D4533?

1 point

- Impact  
 Pull out  
 Thickness  
 Trapezoidal tear

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Trapezoidal tear

15) The width of grips for performing the grab tensile strength is,

1 point

- 76 mm  
 25 mm  
 50 mm  
 200 mm

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
25 mm

16) Some of the mechanical properties of geotextiles are,

1 point

- Thickness  
 Compressibility  
 Burst strength  
 Mass per unit area

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Compressibility  
Burst strength

17) What is the probe diameter used to conduct CBR puncture test as per ASTM D6241?

1 point

- 50 mm  
 10 mm  
 8 mm  
 15 mm

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
50 mm

18) What are the hydraulic properties of geosynthetics?

1 point

- Gradient ratio  
 Permittivity  
 Transmissivity  
 All the above

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
All the above

19) Which of the following is assessed by the gradient ratio test?

1 point

- Durability  
 Cross plane permeability  
 The compatibility between the geotextile and the native soil  
 All the above

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
The compatibility between the geotextile and the native soil

20) What is abrasion resistance?

1 point

- It is the strip tensile strength of an abraded specimen  
 It is the wide width tensile strength of the abraded specimen  
 It is the ratio of the tensile strength of the abraded specimen to that of virgin specimen  
 It is the ratio of the tensile strength of the virgin specimen and the abraded specimen

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
It is the ratio of the tensile strength of the abraded specimen to that of virgin specimen

21) The tensile strength of a geogrid was performed using three ribs as per ASTM D6637. The number of ribs per meter width is 39. If the maximum load in the test was 25 kN, what is the tensile strength of the geogrid?

1 point

- 25 kN/m  
 975 kN/m  
 325 kN/m  
 250 kN/m

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
325 kN/m

22) The data from a cross-plane permeability test is as follows: Head difference = 50 mm, quantity of water collected in 2 minutes is 15 liters. The flow took place through a circular opening of 75 mm diameter. The thickness of the geotextile is 3 mm. Permittivity of the geotextile is,

1 point

- $0.566/s^2$   
 1.55/s  
 0.566/s  
 1.0/s

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
0.566/s

23) In the falling head permeability as per ASTM D4491, the time for the head to fall between these heights is measured,

1 point

- 100 mm to 20 mm  
 80 mm to 50 mm  
 80 mm to 20 mm  
 50 mm to 20 mm

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
80 mm to 20 mm

24) The data from an in plane flow test on a geotextile performed at a normal pressure of 300 kPa is as follows. The quantity of water collected in 3 minutes was 15 liters at a hydraulic gradient of 0.5. The width of the sample is 300 mm. The thickness of the sample at 300 kPa normal pressure is 3.0 mm. The in-plane permeability coefficient ( $k_p$ ) of the geotextile is,

1 point

- 0.093 m/s  
 0.046 m/s  
 0.185 m/s  
 33.33 m/s

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
0.185 m/s

25) The following data was measured from a gradient ratio test. Heads of water 25 mm and 75 mm above the geotextile are 10.5 cm and 15.3 cm respectively. The head of water 25 mm below the sample is 3.9 cm. Estimate the gradient ratio of the sample.

1 point

- 2.75  
 1.73  
 1.25  
 0.69

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
2.75