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Courses » Soil Mechanics/Geotechnical Engineering I

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Unit 5 - Week 3

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Certification exam

Course outline

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portal

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- Lecture 13:
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Assignment 3

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

Due on 2019-02-20, 23:59 IST**1 point**

1)

The data given below relate to two falling head permeameter tests performed on two different soil samples:

(i) stand pipe area = 3.7 cm^2 , (ii) sample area = 28.2 cm^2 , (iii) sample height = 6 cm, (iv) initial head in the stand pipe = 90 cm, (v) final head = 32 cm, (vi) time required for fall of water level in test 1, $t = 511 \text{ s}$, (vii) for test 2, $t = 23 \text{ s}$.

If these two types of soils form adjacent layers in a natural state with flow in the vertical direction, determine the equivalent co-efficient of permeability (in cm/s) by assuming that the thickness of each layer is equal to 165 cm.

(a) 5.23×10^{-3} (b) 4.89×10^{-3} (c) 4.11×10^{-3} (d) 3.04×10^{-3}

- a
 b
 c
 d

No, the answer is incorrect.**Score: 0****Accepted Answers:****d****1 point**

2)

A concrete weir is founded in an anisotropic soil mass. The co-efficient of permeability in the horizontal and vertical directions are respectively $6.0 \times 10^{-4} \text{ mm/s}$ and $1.55 \times 10^{-4} \text{ mm/s}$. Calculate the equivalent co-efficient of permeability of the soil mass in mm/s.

(a) 3.05×10^{-4} (b) 4.23×10^{-4} (c) 4.91×10^{-4} (d) 5.05×10^{-4}

- a
 b
 c

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Week 10

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Solution

3)

1 point

Discharge velocity of water flowing through a soil mass of having porosity 33% is 0 cm/s. Seepage velocity of the flow (in cm/s) is

- (a) 0.77 (b) 0.95 (c) 1.12 (d) 1.57

- a
 b
 c
 d

No, the answer is incorrect.

Score: 0

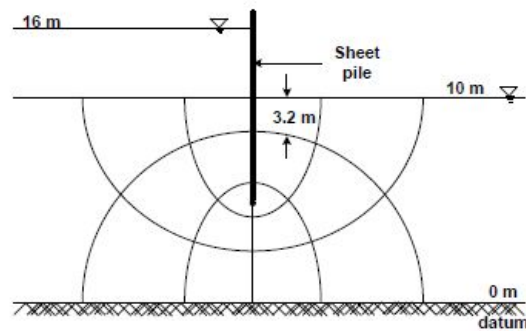
Accepted Answers:

c

4)

1 point

The flow net around a sheet pile wall is shown in Figure 1. The properties of the soil are permeability coefficient = 0.07 m/day (isotropic), specific gravity = 2.68 and void ratio 0.76. The sheet pile wall and the bottom of the soil are impermeable. The seepage loss (m^3 per day per unit length of the wall) of water is



- (a) 0.15 (b) 0.21 (c) 0.28 (d) 0.33

- a
 b
 c
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

b

5)

1 point

As per the data given in Question No. 4 and Figure 1, the factor of safety against piping failure is

- (a) 2.53 (b) 2.74 (c) 3.05 (d) 3.21

- a
 b
 c
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

c

6)

1 point

A pumping out test was made in pervious gravels and sands extending to a depth of 16 m where a bed of clay was encountered. The normal ground water level was at the ground surface. Observation wells were located at distances of 3 m and 7 m from the pumping well. At a discharge of $25 \text{ m}^3/\text{min}$. from the pumping well, a steady state was attained about 24 hr. The draw-down at a distance of 3 m was 2 m and at 7 m was 1.75 m. Compute the hydraulic conductivity in m/s

(a) 3.07×10^{-3} (b) 4.52×10^{-3} (c) 5.33×10^{-3} (d) 5.97×10^{-3}

- a
 b
 c
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

a

7) Sheep-foot rollers are recommended for compacting

1 point

- (a) granular soils
(b) cohesive soils
(c) hard rock
(d) any type of soil

- a
 b
 c
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

b

8) Compaction of soil is measured in terms of

1 point

- (a) dry density
(b) specific gravity
(c) compressibility
(d) permeability

- a
 b
 c
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

a

9) The unit weight of a soil at zero air voids depends on 1 point

- (a) specific gravity
- (b) water content
- (c) unit weight of water
- (d) all the above

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

d

10) 1 point
A soil has a bulk density of 18.1 kN/m^3 . The moisture content is found to be 16.1%. Calculate the dry density of the soil in kN/m^3 .

- (a) 14.2 (b) 15.6 (c) 16.1 (d) 16.8

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

b

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