

Eighth Semester B.E. Degree Examination, June/July 2015

Reinforced Earth Structures

Time: 3 hrs.

Max. Marks:100

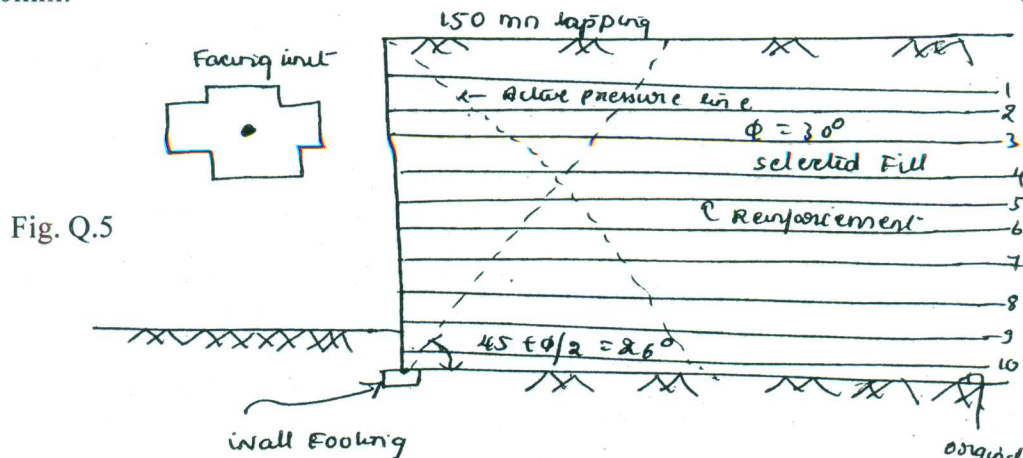
Note: Answer FIVE full questions, selecting at least TWO questions from each part.

PART - A

- 1 a. Define the term 'Reinforced earth'. Hence briefly Explain its historical development as applied to civil engineering. (08 Marks)
 b. Explain the mechanism of reinforced earth. (08 Marks)
 c. What are the advantage and disadvantages of reinforced earth constructions? (04 Marks)
- 2 a. What are geosynthetics? Discuss the classification of geosynthetics. (08 Marks)
 b. Write a note on raw materials used for manufacture of geosynthetics. (06 Marks)
 c. What are geogrids? Explain briefly the method of manufacture of geogrids. (06 Marks)
- 3 a. List and briefly explain the describe properties of geosynthetics. (10 Marks)
 b. Explain briefly Uniaxial and multiaxial tensile strength test. (10 Marks)
- 4 a. What is the assumption made in Reinforced earth retaining walls? (04 Marks)
 b. A 5m high wall is required to retain a horizontal cohesionless backfill with the following characteristics.
 Density of backfill soil, $\gamma = 18 \text{ kN/m}^3$
 Angle of internal friction, $\phi = 30^\circ$
 Angle of wall friction, $\delta = 20^\circ$
 The wall is situated in a seismic area with horizontal seismic co efficient, $\alpha_n = 0.10$. The foundation soil has an allowable soil pressure, q_a of 150 kN/m^2 and co-efficient of sliding friction at base is 0.45. Design the wall adopting suitable reinforcement in the backfill. Compare the design with the wall having unreinforced backfill. (16 Marks)

PART - B

- 5 A 10M vertical embankment is to be built using tension strips in the back filling. The strips are spaced at 1m horizontally. The facing units are of suitable interlocking concrete blocks. Assuming the soil density $\gamma = 18 \text{ kN/m}^3$, $\phi = 30^\circ$ and the friction between the strip and soil δ can be taken as 24° , find the length of the soil reinforcement needed. What other checks should be made in the design of this retaining wall? Assume breadth of reinforcement is 100mm. (20 Marks)





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- 6 a. What are the advantage, limitation and application of Soil nailing technique? (10 Marks)
b. Write the difference between soil nailing and Reinforced soil. (10 Marks)
- 7 a. Explain the design criteria of soil retaining structure. (14 Marks)
b. What is Landfills? Write a note on design of landfills. (06 Marks)
- 8 Explain briefly the function of geosynthetics on roadways. (20 Marks)

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