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B – 2550

Reg. No. :

Name :



Eighth Semester B.Tech. Degree Examination, December 2016
(2008 Scheme)
Branch : CIVIL ENGINEERING
08.807.10 Elective – V : Reinforced Earth (C)

Time : 3 Hours

Max. Marks : 100

Instructions : Answer **all** questions from Part – **A** and **any one** question **each** from **each** Module from Part – **B**. **All** questions in Part **A** carry **equal** marks.

PART – A

1. Explain how the reinforcement strength is mobilized in reinforced soil construction.
2. What are the raw materials used for the manufacture of reinforcements ?
3. Sketch the modes of failures adopted by Binquet and Lee in their analysis of reinforced earth slabs.
4. What is the role of facing in a reinforced soil retaining wall. Sketch any 3 types of facing systems.
5. Sketch the external modes of failures of reinforced soil retaining walls.
6. List the assumptions adopted by Binquet and Lee in their analysis of reinforced earth slabs.
7. Compare and contrast jute and coir fibres with regard to their application as natural geotextile.
8. Give the requirements of the fill soil used in reinforced soil construction.

(8×5=40 Marks)

PART – B

Module – I

9. Explain the manufacturing process of :
 - i) Woven Geotextile
 - ii) Non-Woven geotextiles (needle punched and thermally bonded) and
 - iii) Geogrids.

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OR

P.T.O.



10. a) What are the different types of reinforcements used in the reinforced soil construction ? Mention the advantages and disadvantages of each of them.
- b) Differentiate between filtration and drainage functions performed by geosynthetics.

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Module – II

11. A strip footing is to be placed in sandy soil ($\phi = 38^\circ$, $E = 35000$ kPa, $\mu = 0.3$, $\gamma = 18$ kN/m³) is to carry a maximum line load of 1000 kN/m. The maximum allowable settlement is 25 mm. The footing is to be placed in reinforced earth bed with steel strip reinforcement ($f_y = 240\ 000$ kPa, $\phi_i = 25^\circ$). Take factor of safety of 3 against breakage of reinforcement, friction resistance, and bearing capacity. N_γ and N_q for 38° may be taken as 84 and 52 respectively. Design the reinforcement system.

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OR

12. A reinforced soil retaining wall is to retain 6m high soil ($\phi = 33^\circ$, $\gamma = 15.8$ kN/m³ for the foundation and the back fill). The allowable bearing pressure on the foundation is 200 kPa. Surface of the backfill is horizontal and is subjected to a uniform surcharge pressure of 30 kPa. Geogrid reinforcement with a tensile strength of 70 kN/m shall be used. Design the reinforced soil wall. Take an interaction factor of 0.6. Well graded river sand is proposed to be used as the reinforced soil fill material ($\phi = 40^\circ$, $\gamma = 18$ kN/m³).

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Module – III

13. Explain sliding method, concertina method and telescopic method of construction of reinforced soil retaining walls with sketches.

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OR

14. a) What are the functions performed by geosynthetics ?
- b) What are natural geotextiles ? What are their advantages ? Explain the typical situations where natural geotextiles can be employed.

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