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# P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Sixth Semester B.E. - Civil Engineering

Semester End Examination; August - 2023

Reinforced Earth Structures

Time: 3 hrs

Max. Marks: 100

## Course Outcomes

The Students will be able to:

CO1: Identify, formulate reinforced earth techniques that are suitable for different soils and in different structures.

CO2: Understand the laboratory testing concepts of Geosynthetics.

CO3: Design RE retaining structures and Soil Nailing concepts.

CO4: Determine the load carrying capacity of Foundations resting on RE soil bed.

CO5: Asses the use of Geosynthetics in drainage requirements and landfill designs.

**Note:** I) PART - A is compulsory. Two marks for each question.

II) PART - B: Answer any Two sub questions (from a, b, c) for a Maximum of 18 marks from each unit.

Q. No.	Questions	Marks	BLs	COs	POs
<b>I : PART - A</b>		<b>10</b>			
1 a.	List the advantages of reinforced earth construction.	2	L1	CO1	PO1,2
b.	Define soil nailing technique.	2	L1	CO3	PO1,2,3
c.	What are the guidelines for the use of geo-grids?	2	L1	CO4	PO1,2
d.	Define direct sliding coefficient and write the equation for it.	2	L1	CO5	PO1,2
e.	Write the conventional granular filter design criteria.	2	L1	CO5	PO1,2
<b>II : PART - B</b>		<b>90</b>			
<b>UNIT - I</b>		<b>18</b>			
2 a.	What are the factors affecting the behavior and performance of reinforced soil? Explain briefly.	9	L2	CO1	PO1,2
b.	Write the components of reinforced earth and describe with neat sketch.	9	L2	CO3	PO1,2,3
c.	Discuss the material properties which are generally specified for reinforcement?	9	L2	CO2	PO1,2,3
<b>UNIT - II</b>		<b>18</b>			
3 a.	Write a note on external stability of a reinforced soil.	9	L2	CO3	PO1,2,3
b.	Give the detailed design procedure for the design of soil nailed retaining structures.	9	L2	CO3	PO1,2,3
c.	Write the advantages and disadvantages of soil nailing technique.	9	L2	CO3	PO1,2,3
<b>UNIT - III</b>		<b>18</b>			
4 a.	What are the different modes of bearing capacity failures in reinforced soils? Explain with neat sketch.	9	L2	CO4	PO1,2
b.	Explain briefly about important of bearing capacity in soft soils.	9	L2	CO4	PO1,2
c.	Explain briefly about location of failure surfaces.	9	L2	CO4	PO1,2

**UNIT - IV**

**18**

- 5 a. Explain the control of mud pumping in reinforced roads. 9 L2 CO4 PO1,2
- b. What are functions of geo-synthetics in roads? Explain briefly. 9 L2 CO4 PO1,2
- c. Discuss the approximate location for the placement of geo-textiles in paved roads. 9 L2 CO4 PO1,2

**UNIT - V**

**18**

- 6 a. List the different types of geo-synthesis and explain their role in land filling. 9 L2 CO5 PO2,3
- b. Discuss the various geo-textile filter requirements. 9 L2 CO5 PO2,3
- c. Explain briefly about EPA guidelines for the design of landfills. 9 L2 CO5 PO2,3

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