UNIT – V : Soil Reinforcement, Ground Anchors, Rock Bolting and Soil Nailing

1. Soil reinforcement is the process of

a) Increasing water content in soil
b) Improving soil strength by introducing reinforcing elements
c) Reducing soil density
d) Increasing soil plasticity

Ans: b

2. The primary purpose of soil reinforcement is to

a) Reduce bearing capacity
b) Improve stability and strength
c) Increase settlement
d) Increase pore water pressure

Ans: b

3. Which of the following is commonly used as a reinforcing material?

a) Steel strips
b) Geogrids
c) Geotextiles
d) All of the above

Ans: d

4. Reinforced soil structures mainly resist

a) Tensile forces through reinforcement
b) Compressive forces only
c) Hydraulic forces only
d) Thermal stresses only

Ans: a

5. Geogrids are primarily used for

a) Drainage
b) Reinforcement
c) Waterproofing
d) Filtration only

Ans: b

6. Ground anchors are used to

a) Increase groundwater flow
b) Provide additional stability to retaining structures
c) Reduce soil density
d) Increase permeability

Ans: b

7. Ground anchors transfer load to

a) Weak soil layers
b) Stable soil or rock strata
c) Water table
d) Surface soil only

Ans: b

8. Rock bolting is commonly adopted in

a) Tunnels and rock slopes
b) Soft clay deposits
c) Agricultural fields
d) Pavement construction only

Ans: a

9. The primary function of a rock bolt is to

a) Drain water
b) Hold rock masses together
c) Increase soil moisture
d) Reduce compaction

Ans: b

10. Soil nailing is generally used for

a) Stabilizing excavations and slopes
b) Deep foundation construction
c) Soil classification
d) Groundwater control

Ans: a

11. Soil nails are usually made of

a) Timber
b) Plastic pipes
c) Steel bars
d) Concrete blocks

Ans: c

12. Soil nailing improves stability by

a) Increasing pore pressure
b) Providing tensile resistance
c) Increasing settlement
d) Reducing friction

Ans: b

13. Which technique is suitable for stabilizing steep excavations?

a) Vibro-compaction
b) Soil nailing
c) Dynamic compaction
d) Blasting

Ans: b

14. Reinforced earth structures are widely used in

a) Retaining walls
b) Bridge abutments
c) Embankments
d) All of the above

Ans: d

15. The pullout resistance of reinforcement depends on

a) Soil-reinforcement interaction
b) Color of soil
c) Temperature only
d) Moisture content only

Ans: a

16. Ground anchors may be classified as

a) Temporary and permanent
b) Active and passive
c) Mechanical and hydraulic
d) Surface and deep

Ans: a

17. Rock bolting improves

a) Stability of rock masses
b) Groundwater recharge
c) Soil plasticity
d) Soil permeability

Ans: a

18. A major advantage of soil nailing is

a) Rapid construction and economy
b) Increased settlement
c) Reduced stability
d) Increased pore pressure

Ans: a

19. Which of the following is an in-situ ground reinforcement technique?

a) Soil nailing
b) Rock bolting
c) Ground anchoring
d) All of the above

Ans: d

20. The main objective of modification by inclusions and confinement is to

a) Improve stability and load-carrying capacity of soil
b) Increase compressibility
c) Increase groundwater level
d) Reduce soil strength

Ans: a

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UNIT – V: Modification by Inclusions and Confinement

Fill in the Blanks

1. Soil reinforcement increases soil _____.
   Answer: strength
2. Reinforced soil contains additional reinforcing _____.
   Answer: elements
3. Metal strips are used as soil _____.
   Answer: reinforcements
4. Geogrids are synthetic soil _____.
   Answer: reinforcements
5. Soil reinforcement improves slope _____.
   Answer: stability
6. Ground anchors provide resistance against _____.
   Answer: movement
7. Rock bolts are installed in _____ masses.
   Answer: rock
8. Soil nailing is commonly used for _____ stabilization.
   Answer: slope
9. Geogrids improve load _____.
   Answer: distribution
10. Reinforced earth walls are an example of soil _____.
    Answer: reinforcement
11. Ground anchors transfer load to stable _____.
    Answer: strata
12. Soil nails are generally made of _____.
    Answer: steel
13. Rock bolting increases rock mass _____.
    Answer: stability
14. Reinforcement reduces lateral _____.
    Answer: deformation
15. Geosynthetic reinforcement improves soil _____.
    Answer: performance
16. Soil nailing is an in-situ ground _____.
    Answer: reinforcement
17. Strip reinforcement develops friction with the _____.
    Answer: soil
18. Confinement increases soil _____ resistance.
    Answer: shear
19. Reinforced soil structures are widely used in retaining _____.
    Answer: walls
20. Modification by inclusions enhances overall ground _____.
    Answer: stability