

UNIT - IV : Physical & Chemical Modification - Stabilization and Grouting

1. Soil stabilization is the process of

- a) Increasing soil moisture content
- b) Improving engineering properties of soil
- c) Removing soil particles
- d) Increasing soil permeability only

Ans: b

2. Which of the following is a commonly used stabilizing agent?

- a) Cement
- b) Lime
- c) Fly ash
- d) All of the above

Ans: d

3. Cement stabilization is most effective for

- a) Improving strength and durability
- b) Increasing plasticity
- c) Reducing density
- d) Increasing compressibility

Ans: a

4. Lime stabilization is particularly suitable for

- a) Granular soils
- b) Clayey soils
- c) Rock masses
- d) Gravel deposits

Ans: b

5. Fly ash is mainly used in stabilization as

- a) Reinforcement material
- b) Chemical admixture
- c) Drainage material
- d) Filter material

Ans: b

6. Bituminous stabilization is commonly used in

- a) Highway and pavement construction
- b) Rock bolting
- c) Soil nailing
- d) Deep foundations

Ans: a

7. Calcium chloride stabilization helps in

- a) Dust control and moisture retention
- b) Increasing void ratio
- c) Reducing density
- d) Increasing permeability

Ans: a

8. The main objective of chemical stabilization is to

- a) Improve soil properties
- b) Increase settlement
- c) Increase pore pressure
- d) Reduce bearing capacity

Ans: a

9. Grouting is defined as

- a) Mechanical densification of soil
- b) Injection of grout into soil or rock
- c) Soil reinforcement with steel strips
- d) Surface compaction

Ans: b

10. Grouting is primarily used to

- a) Increase permeability
- b) Reduce strength
- c) Improve strength and reduce seepage
- d) Increase settlement

Ans: c

11. The material injected during grouting is called

- a) Mortar
- b) Slurry
- c) Grout
- d) Concrete

Ans: c

12. Which of the following is a type of grout?

- a) Cement grout
- b) Chemical grout
- c) Clay grout
- d) All of the above

Ans: d

13. Permeation grouting is suitable for

- a) Coarse-grained soils
- b) Hard rock only
- c) Organic soils only
- d) Expansive clays only

Ans: a

14. Compaction grouting improves soil by

- a) Increasing density through displacement
- b) Chemical reaction only
- c) Heating the soil
- d) Freezing the soil

Ans: a

15. Jet grouting involves

- a) Low-pressure injection
- b) High-pressure grout jets
- c) Surface compaction
- d) Electro-osmosis

Ans: b

16. The success of grouting depends on

- a) Soil type
- b) Grout properties
- c) Injection pressure
- d) All of the above

Ans: d

17. Which stabilization method is commonly adopted for expansive soils?

- a) Lime stabilization
- b) Dynamic compaction
- c) Vibro-compaction
- d) Blasting

Ans: a

18. Grouting is commonly used in

- a) Dam foundations
- b) Tunnels
- c) Underground structures
- d) All of the above

Ans: d

19. One advantage of chemical stabilization is

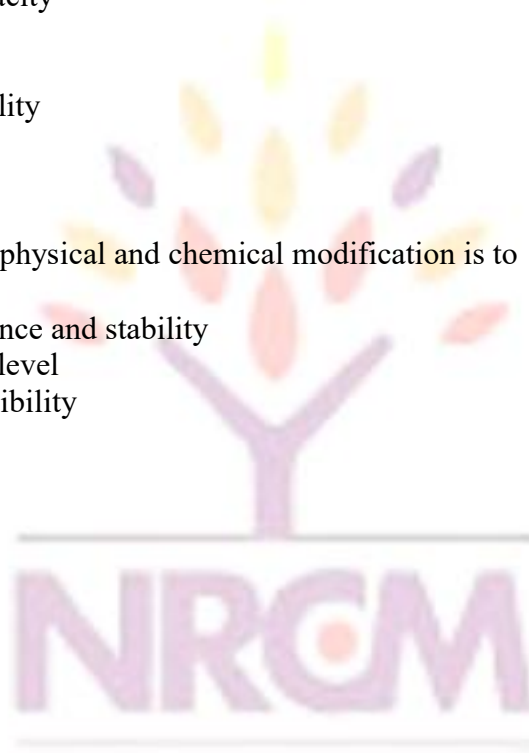
- a) Improved bearing capacity
- b) Reduced strength
- c) Increased settlement
- d) Increased compressibility

Ans: a

20. The main purpose of physical and chemical modification is to

- a) Improve soil performance and stability
- b) Increase groundwater level
- c) Increase soil compressibility
- d) Reduce soil strength

Ans: a



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Fill in the Blanks

1. Soil stabilization by additives is called modification by _____.
Answer: admixtures
2. Lime stabilization is commonly used for _____ soils.
Answer: clayey
3. Cement stabilization increases soil _____.
Answer: strength
4. Fly ash is a commonly used soil _____.
Answer: admixture
5. Grouting involves injecting _____ into the ground.
Answer: grout
6. Permeation grouting fills soil _____.
Answer: voids
7. Chemical stabilization improves soil _____.
Answer: properties
8. Lime reduces soil _____.
Answer: plasticity
9. Cement-treated soil gains _____ with time.
Answer: strength
10. Thermal modification includes soil _____.
Answer: freezing
11. Frozen soil exhibits increased _____.
Answer: strength
12. Grouting can reduce soil _____.
Answer: permeability
13. Chemical additives alter soil _____.
Answer: behavior
14. Jet grouting creates soil-cement _____.
Answer: columns
15. Thermal methods change soil _____.
Answer: temperature
16. Ground freezing forms an impermeable _____.
Answer: barrier
17. Grouting is commonly used beneath _____.
Answer: foundations
18. Lime reacts with soil minerals through _____.
Answer: pozzolanic
19. Chemical stabilization enhances soil _____.
Answer: durability
20. Thermal stabilization is useful in underground _____.
Answer: excavations