

**\*\*\* EXAMINATION \*\*\***

**CHEMICAL GROUTING**

1. **Chemical grouts react to form:**
  - a) solids
  - b) semisolids
  - c) gels
  - d) All of the above.
  
2. **Chemical grouting is:**
  - a) an injection process
  - b) involves two chemicals of neutral PH
  - c) involves a gas and a solid to form a liquid.
  - d) None of the above.
  
3. **Materials used in the pumps and chemical being pumped**
  - a) should be reactive
  - b) should be compatible
  - c) should be non-reactive
  - d) should be explosive under a controlled environment
  
4. **Chemical grouting is often used for:**
  - a) cleaning concrete surfaces
  - b) remediation work for deteriorated structures.
  - c) dissolving materials flowing through concrete structures.
  - d) None of the above.
  
5. **Selecting a chemical grout for an application will evaluate:**
  - a) viscosity, durability, and strength.
  - b) porosity, viscosity, and durability.
  - c) porosity, strength, and viscosity.
  - d) strength, compatibility, and viscosity.
  
6. **The centipoise is a measure of:**
  - a) porosity
  - b) strength
  - c) viscosity
  - d) durability.

7. **Gel time is a function of the these components:**
- a) activator, viscosity, inhibitor
  - b) activator, inhibitor, catalyst.
  - c) viscosity, inhibitor, catalyst
  - d) inhibitor, viscosity, catalyst
8. **Resistance to wetting, drying, freezing, and thawing is**
- a) durability
  - b) strength
  - c) viscosity factor
  - d) centipoise
9. **Chemical grouting can be used:**
- a) to eliminate water.
  - b) to control water movement.
  - c) to increase the flow of water.
  - d) None of the above.
10. **A disadvantage of a chemical grout may be:**
- a) permeability
  - b) strength
  - c) viscosity
  - d) groundwater pollution
11. **The most common type of chemical grout is:**
- a) sodium silicate
  - b) sodium chloride
  - c) sodium nitrate
  - d) sodium borate.
12. **The function of the grout, injected medium, and technique of**
- a) injection is permeability
  - b) injection is porosity
  - c) injection is penetration
  - d) None of the above
13. **Grouts that are continually moving will gel:**
- a) less quickly
  - b) more quickly
  - c) with less penetration.
  - d) None of the above.
14. **Alkaline earth includes:**
- a) calcium chloride
  - b) magnesium sulfate
  - c) magnesium chloride
  - d) All of the above

15. **High durability, cost, and toxicity is typical of:**
- a) lignins
  - b) urethanes
  - c) silicates
  - d) acrylates
16. **Applications to reduce water flow rarely use:**
- a) sodium silicate
  - b) acrylate
  - c) resins
  - d) lignins.
17. **The system used to increase the bearing capacity of a**
- a) foundation is silicate-chloride-amide
  - b) foundation is silicate-aluminate-amide
  - c) foundation is silicate-hydrate-amide
  - d) None of the above
18. **The Malmberg systems uses:**
- a) a nitrate salt of a weak acid
  - b) a silicate salt of a strong acid
  - c) a silicate salt of a strong alkali
  - d) a silicate salt of a weak acid
19. **Grout penetration is influenced by the following factors:**
- a) depth of overburden
  - b) allowable pressure
  - c) distribution of particle sizes
  - d) All of the above
20. **The gel time increases**
- a) as the reactant concentration increases
  - b) as the silicate concentration decreases
  - c) as the silicate concentration increases
  - d) as temperature increases

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