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Examination for Chemical Grouting Part 1

1. Chemical grouts are injected into voids as _____.
 - a) solutions
 - b) compounds
 - c) gritting agents
 - d) paste

2. Why are chemical grouts needed?
 - a) to develop strength and control water flow in geologic units where the pore sizes in the rock or soil units were too small to allow the introduction of conventional portland-cement suspensions
 - b) to maintain strength while preventing water flow in geologic units where the pore sizes in the rock or soil units were too small to allow the introduction of conventional portland-cement suspensions
 - c) to strengthen a concrete structure with weak compressive strength
 - d) to repair a concrete structure that has failed a stress test

3. The flowability of the grout is also related to the hydraulic conductivity (also known as _____) of the soil.
 - a) permeability
 - b) viscosity
 - c) solubility
 - d) compound strength

4. For some grouts, the _____ may be constant throughout the entire gel time or may change during this period.
 - a) fractal strength
 - b) permeability
 - c) mix ratio
 - d) viscosity

5. The viscosities of chemical grouts can be very high, and chemical grouts can have solid properties.
- true
 - false
 - not enough information for a specific answer
 - too many variables for a specific answer
6. The most common types of chemical grouts are sodium silicate, acrylate, lignin, _____, and resin grouts.
- organic
 - adhesive
 - urethane
 - none of the above
7. The two-solution process using sodium silicate and calcium chloride is also referred to as the _____.
- Woodsen two-shot technique
 - Joosten two-shot technique
 - Harden two-shot technique
 - none of the above
8. Which two major grout properties are non-flammable?
- portland-cement based grouts and silicates
 - acrylates and lignins
 - urethanes and resins
 - none of the above
9. Reactants used in the one-solution process neutralize the _____ of sodium silicate in a way similar to the two-solution system, but the reactants are diluted and materials that react slowly (such as organic reagents) are used.
- viscosity
 - texture
 - alkalinity
 - ph balance
10. This system of chemical grouting has been successfully used for solidification of materials below the water table.
- silicate system
 - silicate-chloride-amide system
 - silicate-aluminate-amide system
 - none of the above

11. The most fluid silicate grout is a grout with the highest silicate concentration.
- true
 - false
 - not enough information for a specific answer
 - too many variables for a specific answer
12. The production of a silicic acid gel by the mixture of a solution of sodium silicate with a solution of the salt of a weak acid is known as the _____?
- Malmberg system
 - Walberg system
 - Prentiss system
 - acidic system
13. Which of the following factors do not affect the gel time of a one-solution silicate grout?
- an increase in temperature
 - the presence of soluble salts and phosphates in the medium to be grouted
 - an increase in silicate concentration
 - direct sunlight
14. Reactants such as amide and their water solutions are non-corrosive to _____.
- aluminum and stainless steel
 - copper and brass
 - copper and stainless steel
 - none of the above
15. What kind of material treated with silicate grout has an unconfined compressive strength of 4,000 kPa.
- very loose granular material saturated with a silicate grout, cured dry
 - very loose granular materials saturated with a silicate grout, cured at 80-100% relative humidity
 - very loose granular materials saturated with a silicate grout, cured underwater
 - compact, medium-grain granular materials saturated with a silicate grout, wet subsurface
16. Used as a filler in silicate grouts, portland cement acts as _____.
- a gel
 - an accelerator
 - a decelerator
 - a solidifying agent

17. The low viscosity and ability to develop long gel times (up to 120 min) make _____ grouts useful in fine sediments.
- a) acrylate
 - b) granular
 - c) sedimentary
 - d) adhesive
18. Which factor(s) affect the application of urethanes?
- a) weather elements
 - b) durability and ease of application
 - c) the compressive strength of material before grouting
 - d) toxicity and adaptability
19. Lignin grouts are acceptable if chromium compounds are used.
- a) true
 - b) false
 - c) not enough information for a specific answer
 - d) too many variables for a specific answer
20. The materials used in lignin grouts are soluble in water.
- a) true
 - b) false
 - c) not enough information for a specific answer
 - d) too many variables for a specific answer
21. Epoxy and polyester are used as what type of grout?
- a) acrylate
 - b) lignin
 - c) resin
 - d) urethane
22. A water-based-resin grouting material having an initial viscosity of approximately _____ is commercially available.
- a) 2 cP
 - b) 4 cP
 - c) 6 cP
 - d) 10 cP
23. Which of the following is not a chemical grout?
- a) bituminous polymer system
 - b) cationic organic-emulsion
 - c) epoxy-bitumen system
 - d) polyphenolic polymer system

24. The simplest grout mixing system is a _____ system.
- a) sorting
 - b) batch
 - c) two-tank
 - d) none of the above
25. The simplex pump and duplex pump are categorized as what type of pumping machine?
- a) positive-displacement pumps
 - b) piston pumps
 - c) double modulation pumps
 - d) single modulation pumps



Answer Sheet for Chemical Grouting Pt 1
 TPDH-00015

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