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Examination for Instrumentation of Embankment Dams and Levees

CHAPTER 1 - INTRODUCTION

1. Which chapter covers commonly used devices and technologies for embankment monitoring?
 - a) Chapter 2
 - b) Chapter 4
 - c) Chapter 3
 - d) Chapter 5

2. Which of the following is not listed as a primary use of this manual?
 - a) The modification or replacement of instrument systems
 - b) The planning and design of instrument systems
 - c) The economic benefits of instrument systems
 - d) The continuous use of instrument systems

CHAPTER 2 – BEHAVIOR OF EMBANKMENTS AND ABUTMENTS

3. Which of the following is not a term to describe the spaces between solid particles in soil?
 - a) Voids
 - b) Space voids
 - c) Pore spaces
 - d) Pores

4. The decrease of the excess pore water pressure is known as what?
 - a) Consolidation
 - b) Settlement
 - c) Deformation
 - d) Dissipation

5. The water-bearing stratum containing the groundwater is known as what?
 - a) Aquifer
 - b) Groundwater table
 - c) Hydrostatic zone
 - d) Capillary zone

6. Which pipe in figure 2-3 is considered an observation well?
- a) Pipe (a)
 - b) Pipe (b)
 - c) Pipe (c)
 - d) Pipe (d)
7. Which of the following is not listed as a mechanism controlling the engineering behavior of soils?
- a) Strength characteristics
 - b) Stress-deformation characteristics
 - c) Hydrostatic characteristics
 - d) Hydraulic characteristics

CHAPTER 3 – INSTRUMENTATION CONCEPTS, OBJECTIVES AND SYSTEM DESIGN

8. Geotechnical instrumentation is a stand-alone solution to monitoring embankment performance?
- a) True
 - b) False
 - c) Not enough information for a specific answer
 - d) Too many variables for a specific answer
9. Which of the following appears first in the steps for developing an instrumentation system?
- a) Planning long-term protection
 - b) Selection of instruments
 - c) Determination of costs
 - d) Selection of instrument locations
10. What is the most desirable feature in the selection of monitoring instruments?
- a) Reliability
 - b) Cost effectiveness
 - c) Accuracy
 - d) Accessibility

CHAPTER 4 – SUMMARY OF MEASUREMENT METHODS

11. Which of the following is a structural parameter measurement not covered in this manual?
- a) Total stress
 - b) Deformation
 - c) Uplift pressure
 - d) Temperature

12. What is the typical riser pipe diameter in an observation well?
- 1 inch
 - 1.25 inches
 - 1.5 inches
 - 2 inches
13. All piezometers include an intake filter?
- True
 - False
 - Not enough information for a specific answer
 - Too many variables for a specific answer
14. Which of the following is not listed as an advantage of vibrating wire piezometers?
- Short time lag
 - Easy to read
 - Reliable
 - No freezing problems
15. Which of the following is not listed as a type of probe extensometer?
- Crossarm coil probe
 - Induction coil gauge
 - Magnet/reed switch gauge
 - Mechanical probe
16. What is the diameter of the inner riser pipe of a spiral-foot subsurface settlement point?
- 1/2 inch
 - 1 1/2 inches
 - 1 7/8 inches
 - 1/4 inch
17. Aluminum alloy casings are recommended for use with inclinometers?
- True
 - False
 - Not enough information for a specific answer
 - Too many variables for a specific answer
18. Which of the following is not listed as a suitable instrument for measuring the horizontal deformation below the surface?
- Probe inclinometer
 - Horizontal plate gauge
 - Double-fluid settlement gauge
 - Horizontal control station

19. With contact earth pressure cells, how thick should the steel plate be that is placed between the cell and the structure's concrete?
- a) 0.25 in.
 - b) 0.50 in.
 - c) 0.75 in.
 - d) 1.00 in.
20. Which type of instrument for remote measurement of temperature has the best suitability for automatic data acquisition?
- a) Resistance thermostat
 - b) Thermistor
 - c) Resistance temperature device
 - d) Thermocouple
21. How much recording time is available with 512k bytes in a digital accelerograph?
- a) 10 minutes
 - b) 30 minutes
 - c) 20 minutes
 - d) 40 minutes

CHAPTER 5 – AUTOMATION CONSIDERATIONS

22. Which of the following is not listed as a type of configuration for an automated system?
- a) Distribution automation
 - b) Scada
 - c) Distributed intelligence
 - d) Datalogger
23. What is the only category 1 type of piezometer?
- a) Pneumatic
 - b) 4-20 mA pressure transducer
 - c) Twin-tube hydraulic
 - d) Vibrating wire
24. What is the automation method for a Thermistor?
- a) Current readout
 - b) Time readout
 - c) Frequency counter
 - d) Resistance readout

CHAPTER 6 - INSTALLATION

25. Which of the following is not listed as to be included in the specifications if a contractor is to install an automation system?
- a) Performance criteria
 - b) Storage of instruments
 - c) Post-installation inspection
 - d) Protection of instruments
26. The practice of drilling in embankments or foundations using air is not allowed?
- a) True
 - b) False
 - c) Not enough information for a specific answer
 - d) Too many variables for a specific answer
27. Installation of bentonite in powdered or slurry form should be used in piezometer boreholes?
- a) True
 - b) False
 - c) Not enough information for a specific answer
 - d) Too many variables for a specific answer

CHAPTER 7 – DATA MANAGEMENT, ANALYSIS AND REPORTING

28. Which of the following is not considered part of the data management process?
- a) Presentation
 - b) Engineering analysis
 - c) Data collection
 - d) Reduction and processing
29. In figure 7-1, what is the highest pool elevation achieved?
- a) 1135 ft.
 - b) 1145 ft.
 - c) 1187 ft.
 - d) 1155 ft.
30. In figure 7-3, when was the lowest temperature reading taken?
- a) OCT 92
 - b) DEC 91
 - c) JUL 92
 - d) MAR 92

CHAPTER 8 – INSTRUMENT MAINTENANCE

31. When should the owning agency's maintenance requirements and procedures be planned?
- a) During the design of the instrumentation system
 - b) During the construction of the instrumentation system
 - c) During the planning of the instrumentation system
 - d) During the operation of the instrumentation system
32. Which of the following is not listed as a component of most instrumentation systems?
- a) Embedded components
 - b) Automation equipment
 - c) Portable readout units
 - d) Retrievable components
33. What material should be used to flush the tubes in a pneumatic piezometer?
- a) Compressed air
 - b) Nitrogen gas
 - c) De-aired water
 - d) Purified water
34. Strong motion instrumentation maintenance is covered in what standard?
- a) ER 1110-2-1914
 - b) EM 1110-2-103
 - c) EM 1110-2-1914
 - d) ER 1110-2-103

CHAPTER 9 – CONTINUAL REASSESSMENT FOR LONG-TERM MONITORING

35. Construction-related instruments should be maintained if they can assist in answering long-term questions?
- a) True
 - b) False
 - c) Not enough information for a specific answer
 - d) Too many variables for a specific answer
36. Which of the following generally refers to the modification of a functioning instrument or system?
- a) Rehabilitate
 - b) Retrofit
 - c) Upgrade
 - d) Replace

37. What is the least recommended instrument for measuring pore water pressure?
- a) Electrical resistance piezometer
 - b) Twin-tube hydraulic piezometer
 - c) Vibrating wire piezometer
 - d) Open standpipe piezometer



Answer Sheet for Instrumentation of Embankment Dams & Levees
 TPDH-00032

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I hereby certify that I have studied the course materials, and the above answers are my own.
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