

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

**INSTRUMENTATION OF EMBANKMENT DAMS AND LEVEES**

1. **Basic instrumentation for monitoring of dams includes:**
  - a) seepage
  - b) pressure
  - c) movement
  - d) All of the above
  
2. **Pore space may be filled with:**
  - a) gas
  - b) oil
  - c) salt
  - d) acid
  
3. **Unsaturated soil is filled with:**
  - a) water
  - b) oil
  - c) gas
  - d) acid
  
4. **Two types of soil groups include:**
  - a) saturated and unsaturated
  - b) consolidated and unconsolidated
  - c) cohesionless and cohesive
  - d) aerated and porous
  
5. **The units of stress are:**
  - a) pounds per square foot
  - b) pascals
  - c) ounces per square inch
  - d) None of the above
  
6. **Pore water pressure exceeds equilibrium pore pressure by:**
  - a) excess pore water pressure
  - b) consolidation
  - c) settlement
  - d) deformation

7. **Dissipation is:**
- a) the increase of excess pore pressure
  - b) the decrease of excess pore pressure
  - c) vertical deformation
  - d) normal consolidation
8. **To measure the gains in shear strength during consolidation:**
- a) monitor the pore water pressure
  - b) monitor the hydraulic load
  - c) monitor the moment of water pressure
  - d) None of the above
9. **The groundwater level is:**
- a) an elevation
  - b) the point of equilibrium with atmospheric pressure
  - c) below the surface of the ground
  - d) All of the above
10. **An aquifer is:**
- a) a well
  - b) spring
  - c) the water-bearing stratum containing the groundwater.
  - d) surface groundwater
11. **Earth embankments experience failure by:**
- a) overtopping
  - b) instability
  - c) internal seepage
  - d) All of the above
12. **Piping is also known as:**
- a) internal erosion
  - b) soil flowage
  - c) water velocity
  - d) seepage path
13. **Exploration and analysis of embankment projects require:**
- a) a hydraulic engineer
  - b) a geotechnical engineer
  - c) a seismic engineer
  - d) a soils engineer
14. **The objectives of a geotechnical instrumentation plan includes:**
- a) analytical assessment and prediction of future performance
  - b) legal evaluation and implement assumptions
  - c) implement assumptions and development of future design
  - d) None of the above

15. **The order of selection of an instrumentation system is:**
- a) instruments, determination of costs, and instrument locations
  - b) instruments, planning installation, and instrument locations
  - c) instrument locations, instruments, and planning installation
  - d) parameters to monitor, planning installation, and instruments
16. **Typical parameters that can be monitored include:**
- a) temperature
  - b) seismic events
  - c) water levels
  - d) All of the above
17. **The most desirable feature of a monitoring instrument is:**
- a) durability
  - b) reliability
  - c) precision
  - d) accuracy
18. **Instrumentation should be installed by:**
- a) the geotechnical engineer
  - b) the electronics engineer
  - c) the design engineer
  - d) the project manager
19. **Most electronic instrumentation measurement methods contain:**
- a) a transducer
  - b) a data acquisition system
  - c) a linkage between the transducer and data acquisition system
  - d) All of the above
20. **The purpose of an electric coil in an induction transducer is:**
- a) create a magnetic field around the coil
  - b) maximize the current in the coil
  - c) eliminate surges
  - d) provide an effective power breaker

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