

***** EXAMINATION *****

SETTLEMENT ANALYSIS

1. Soil is a material consisting of three phases:

- a) solids, fluid, and air
- b) solids, oxygen, and water
- c) oxygen, water, and sand
- d) nitrogen, fertilizer, and solids

2. A movement of soil may be:

- a) elastic deformation
- b) erosion
- c) accretion
- d) disintegration

3. Consolidation is caused by a reduction in:

- a) gases
- b) organic materials
- c) solids
- d) water content

4. A soil movement may be caused by:

- a) dynamic forces
- b) expansive soil
- c) collapsible soil
- d) All of the above

5. Soil movements may be minimized by:

- a) replacing soil with a lower grade soil
- b) drying of expansive soil
- c) wetting of collapsible soil
- d) post compression of soft soil

6. The sensitivity of clay is:

- a) the ratio of disturbed to remolded strength
- b) the ratio of undisturbed to remolded strength
- c) the ratio of preconsolidated to eroded clay
- d) the ratio of consolidated to eroded clay

7. **Clays expand or contract because:**
- a) of changes in water content
 - b) of changes in gas content
 - c) of changes in surface chemical content
 - d) of changes in temperature
8. **Factors inducing settlement include:**
- a) earthquakes
 - b) blasting
 - c) pile driving
 - d) All of the above
9. **Glacial tills are good foundation soils except for:**
- a) the intense porosity of the soil
 - b) the hard layers
 - c) the existence of boulders
 - d) the variability of texture
10. **Soils that fill abandoned waterways are:**
- a) strong and not compressible
 - b) weak and highly compressible
 - c) strong and highly compressible
 - d) weak and not compressible
11. **Differential settlement is the difference in the:**
- a) vertical movement between various locations of the structure
 - b) horizontal movement between various locations of the structure
 - c) vertical shear
 - d) combined vertical and horizontal shear
12. **The maximum allowable average settlement is greatest for:**
- a) plain brick walls
 - b) framed structures
 - c) reinforced brick walls
 - d) solid reinforced concrete foundations
13. **The total settlement is:**
- a) the immediate or distortion settlement
 - b) the primary consolidation settlement
 - c) the secondary compression settlement
 - d) the sum of the above three components
14. **The following is a method for calculating immediate settlement:**
- a) Newton
 - b) Schmertmann
 - c) Welch
 - d) Hanson

15. **The immediate elastic settlement at the center and edge of:**
- a) circular foundations is approximated by Hanson
 - b) circular foundations is approximated by Welch
 - c) circular foundations is approximated by Kay and Cavagnaro
 - d) circular foundations is approximated by Schertmann
16. **The coefficient of consolidation for both virgin compression:**
- a) and recompression is decreased by soil disturbance
 - b) and recompression is increased by soil disturbance
 - c) and recompression is changed when the temperature varies
 - d) and recompression is changed when the humidity varies
17. **The soil type having the largest coefficient of secondary**
- a) compression is peat
 - b) compression is inorganic
 - c) compression is silt
 - d) compression is muskeg
18. **An example of dynamic settlement is:**
- a) buildings
 - b) traffic pavements
 - c) retaining walls
 - d) None of the above
19. **The amount of dynamic settlement depends on:**
- a) the initial density of the soil
 - b) the thickness of the soil stratum
 - c) the maximum shear strain developed in the soil
 - d) All of the above
20. **Elastic Young's Modulus is used to:**
- a) estimate settlements from dynamic loads
 - b) compute the elasticity of soil
 - c) estimate settlement from static loads
 - d) compute the shear strength of sand

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