

***** EXAMINATION *****

ARCTIC AND SUBARCTIC CONSTRUCTION FOUNDATIONS FOR STRUCTURES

1. **With increasing latitude or elevation, mean annual:**
 - a) temperatures may increase or decrease
 - b) temperatures remain constant
 - c) temperatures decrease
 - d) temperatures increase

2. **In North America permafrost is found principally north of:**
 - a) latitudes 45 to 55
 - b) latitudes 55 to 65
 - c) latitudes 65 to 75
 - d) latitudes 75 to 85

3. **The amplitude of annual temperature variation becomes small:**
 - a) below a depth in the of 30 to 60 feet
 - b) below a depth in the of 40 to 70 feet
 - c) below a depth in the of 50 to 80 feet
 - d) below a depth in the of 60 to 90 feet

4. **The penetration of freezing temperatures into the ground:**
 - a) depends upon such factors as surface conditions
 - b) depends upon such factors as radiation
 - c) depends upon such factors as weather
 - d) all of the above

5. **Mean annual wind speeds for most arctic and subarctic:**
 - a) locations are usually of the order of 5 to 10 mph
 - b) locations are usually of the order of 10 to 15 mph
 - c) locations are usually of the order of 15 to 20 mph
 - d) locations are usually of the order of to 20 25 mph

6. **In far northern areas the maximum surface cracking effects:**
 - a) tend to develop in the fall
 - b) tend to develop in the winter
 - c) tend to develop in the spring
 - d) tend to develop in the summer

7. **For significant frost heave the water table should be within:**
- a) 2 feet of the plane of freezing
 - b) 5 feet of the plane of freezing
 - c) 8 feet of the plane of freezing
 - d) 11 feet of the plane of freezing
8. **A good maximum saturation for building stone and mineral:**
- a) aggregate is 57 percent
 - b) aggregate is 67 percent
 - c) aggregate is 77 percent
 - d) aggregate is 87 percent
9. **Organic soils range from only slightly organic mineral soil:**
- a) to 70 percent organic muskeg or peat
 - b) to 80 percent organic muskeg or peat
 - c) to 90 percent organic muskeg or peat
 - d) to 100 percent organic muskeg or peat
10. **One hundred percent organic muskeg or peat cover about:**
- a) 10 percent of the land area of Alaska
 - b) 20 percent of the land area of Alaska
 - c) 30 percent of the land area of Alaska
 - d) 40 percent of the land area of Alaska
11. **A principal use of lumber in foundations is in:**
- a) tossing
 - b) stacking
 - c) piling
 - d) pounding
12. **The predominant problem encountered with use of metal in:**
- a) in cold regions is cold embrittlement use
 - b) in cold regions is cold embrittlement fracture
 - c) in cold regions is cold embrittlement warming
 - d) none of the above
13. **A small group of metals remaining ductile**
- a) at low temperatures include nickel
 - b) at low temperatures include copper
 - c) at low temperatures include aluminum
 - d) all of the above
14. **Concrete should be protected from freezing for the first:**
- a) 24 hours
 - b) 48 hours
 - c) 72 hours
 - d) 96 hours

15. **Unless favorable foundation conditions exist:**
- a) concrete block masonry construction should be avoided
 - b) brick masonry construction should be avoided
 - c) precast concrete should be avoided
 - d) both a and b
16. **The thermal conductivity of soil is dependent upon:**
- a) density
 - b) moisture content
 - c) particle shape
 - d) all of the above
17. **The extremely slow downslope movement of surficial soil is:**
- a) slope creep
 - b) hill creep
 - c) mountain creep
 - d) road creep
18. **Foundation insulation may be used to control heat flow:**
- a) for comfort
 - b) for heating economy
 - c) to control condensation
 - d) all of the above
19. **Only closed-cell types of insulation should be used:**
- a) in walls
 - b) above ground
 - c) underground
 - d) in roofs
20. **A type of concrete floor used in basementless houses:**
- a) solid floors
 - b) heated floors containing heated pipes for panel heating
 - c) reinforced floors
 - d) exterior floor

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