

# Interview Questions

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## 300+ TOP Soil Mechanics & Foundation Engineering MCQs Pdf

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### Soil Mechanics and Foundation Engineering

#### Multiple Choice Questions :-

**1. Residual soils are formed by**

- a) glaciers
- b) wind
- c) water
- d) none of the above

Ans:d

**2. Water content of soil can**

- a) never be greater than 100 %
- b) take values only from 0 % to 100 %

Downl

- c) be less than 0 %
- d) be greater than 100 %

Ans:d

**3. Which of the following types of soil is transported by gravitational forces ?**

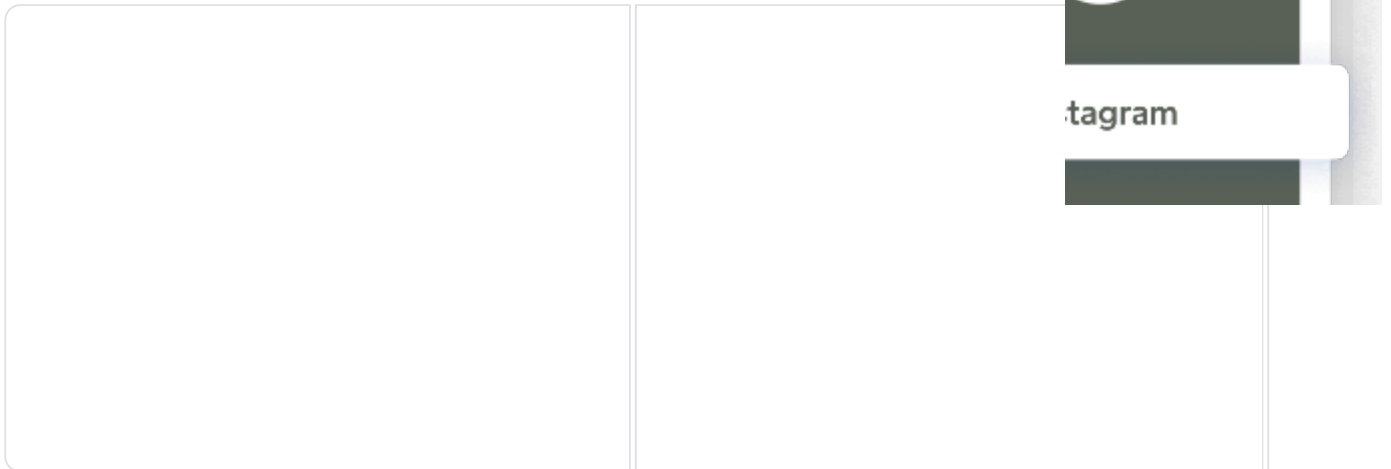
- a) loess
- b) talus
- c) drift
- d) dune sand

Ans:b

**4. A fully saturated soil is said to be**

- a) one phase system
- b) two phase system with soil and air
- c) two phase system with soil and water
- d) three phase system

Ans:c



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**5. Valid range for S, the degree of saturation of soil in percentage is**

- a)  $S > 0$
- b)  $S < 0$
- c)  $0 < S < 100$
- d)  $0 < S < 100$

Ans:d

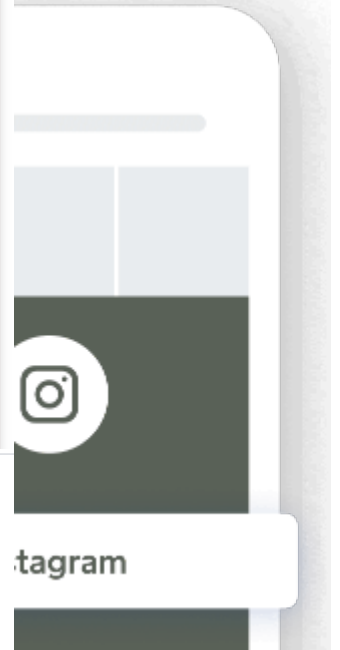


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# SOIL MECHANICS & FOUNDATION ENGINEERING VIMP MCQ

SOIL MECHANICS and FOUNDATION  
Engineering MCQs

**6. Constant head permeameter is used to test permeability of**

- a) silt
- b) clay
- c) coarse sand
- d) fine sand

Ans:c

**7. A soil has a bulk density of 22 kN/m<sup>3</sup> and water content 10 %. The dry density of soil is**

- a) 18.6 kN/m<sup>3</sup>
- b) 20.0 kN/m<sup>3</sup>
- c) 22.0 kN/m<sup>3</sup>
- d) 23.2 kN/m<sup>3</sup>

Ans:b

**8. If the voids of a soil mass are full of air only, the soil is termed as**

- a) air entrained soil
- b) partially saturated soil
- c) dry soil
- d) dehydrated soil

Ans:c

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**9. Valid range for  $n$ , the percentage voids, is**

- a)  $0 < n < 100$
- b)  $0 < n < 100$
- c)  $n > 0$
- d)  $n < 0$

Ans:a

**10. Select the correct statement.**

- a) Unit weight of dry soil is greater than unit weight of wet soil.
- b) For dry soils, dry unit weight is less than total unit weight.
- c) Unit weight of soil increases due to submergence in water.
- d) Unit weight of soil decreases due to submergence in water.

Ans:d

**11. Voids ratio of a soil mass can**

- a) never be greater than unity
- b) be zero
- c) take any value greater than zero
- d) take values between 0 and 1 only

Ans:c

**12. If the volume of voids is equal to the volume of solids in a soil mass, then the values of porosity and voids ratio respectively are**

- a) 1.0 and 0.0
- b) 0.0 and 1.0
- c) 0.5 and 1.0
- d) 1.0 and 0.5

Ans:c

**13. When the degree of saturation is zero, the soil mass under consideration represents**

- a) one phase system
- b) two phase system with soil and air
- c) two phase system with soil and water
- d) three phase system

Ans:b

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**14. Select the correct range of density index, ID**

- a)  $ID > 0$
- b)  $ID > 0$
- c)  $0 < ID < 1$
- d)  $0 < ID < 1$

Ans:d

**15. If the degree of saturation of a partially saturated soil is 60%, then air content of the soil is**

- a) 40%
- b) 60%
- c) 80%
- d) 100%

Ans:a

**16. If the water content of a fully saturated soil mass is 100%, then the voids ratio of the sample is**

- a) less than specific gravity of soil
- b) equal to specific gravity of soil
- c) greater than specific gravity of soil
- d) independent of specific gravity of soil

Ans:b

**17. The ratio of volume of voids to the total volume of soil mass is called**

- a) air content
- b) porosity
- c) percentage air voids
- d) voids ratio

Ans:b

**18. Relative density of a compacted dense sand is approximately equal to**

- a) 0.4
- b) 0.6
- c) 0.95
- d) 1.20

Ans:c

**19. If the sand in-situ is in its densest state, then the relative density of sand is**

- a) zero
- b) 1
- c) between 0 and 1
- d) greater than 1

Ans:b

**20. Which of the following methods is most accurate for the determination of the water content of soil ?**

- a) oven drying method
- b) sand bath method
- c) calcium carbide method
- d) pycnometer method

Ans:a

**21. For proper field control, which of the following methods is best suited for quick determination of water content of a soil mass ?**

- a) oven drying method
- b) sand bath method
- c) alcohol method
- d) calcium carbide method

Ans:d

**22. A pycnometer is used to determine**

- a) water content and voids ratio
- b) specific gravity and dry density
- c) water content and specific gravity
- d) voids ratio and dry density

Ans:c

**23. Stoke's law is valid only if the size of particle is**

- a) less than 0.0002 mm
- b) greater than 0.2 mm
- c) between 0.2 mm and 0.0002 mm
- d) all of the above

Ans:c

**24. In hydrometer analysis for a soil mass**

- a) both meniscus correction and dispersing agent correction are additive
- b) both meniscus correction and dispersing agent correction are subtractive
- c) meniscus correction is additive and dispersing agent correction is subtractive
- d) meniscus correction is subtractive and dispersing agent correction is additive

Ans:c

**25. The hydrometer method of sedimentation analysis differs from the pipette analysis mainly in**

- a) the principle of test
- b) the method of taking observations
- c) the method of preparation of soil suspension
- d) all of the above

Ans:b

**26. Which of the following is a measure of particle size range ?**

- a) effective size
- b) uniformity coefficient
- c) coefficient of curvature
- d) none of the above

Ans:b

**27. Which of the following statements is correct?**

- a) Uniformity coefficient represents the shape of the particle size distribution curve.
- b) For a well graded soil, both uniformity coefficient and coefficient of curvature are nearly unity.
- c) A soil is said to be well graded if it has most of the particles of about the same size
- d) none of the above

Ans:d

**28. Uniformity coefficient of a soil is**

- a) always less than 1
- b) always equal to 1
- c) equal to or less than 1
- d) equal to or greater than 1

Ans:d

**29. According to Atterberg, the soil is said to be of medium plasticity if the plasticity index PI is**

- a)  $0 < PI < 7$
- b)  $7 < PI < 17$
- c)  $17 < PI < 27$
- d)  $PI > 27$

Ans:b

**30. If the natural water content of soil mass lies between its liquid limit and plastic limit, the soil mass is said to be in**

- a) liquid state
- b) plastic state
- c) semi-solid state
- d) solid state

Ans:b

**32. When the plastic limit of a soil is greater than the liquid limit, then the plasticity index is reported as**

- a) negative
- b) zero
- c) non-plastic (NP)
- d) 1

Ans:b



**33. Toughness index is defined as the ratio of**

- a) plasticity index to consistency index
- b) plasticity index to flow index
- c) liquidity index to flow index
- d) consistency index to liquidity index

Ans:b

**34. If the plasticity index of a soil mass is zero, the soil is**

- a) sand
- b) silt
- c) clay
- d) clayey silt

Ans:a

**35. The admixture of coarser particles like sand or silt to clay causes**

- a) decrease in liquid limit and increase in plasticity index
- b) decrease in liquid limit and no change in plasticity index
- c) decrease in both liquid limit and plasticity index
- d) increase in both liquid limit and plasticity index

Ans:c

**36. Select the correct statement.**

- a) A uniform soil has more strength and stability than a non-uniform soil.
- b) A uniform soil has less strength and stability than a non-uniform soil.
- c) Uniformity coefficient does not affect strength and stability.
- d) Uniformity coefficient of a poorly graded soil is more than that of a well graded soil.

Ans:b

**38. The water content of soil, which represents the boundary between plastic state and liquid state, is known as**

- a) liquid limit
- b) plastic limit
- c) shrinkage limit
- d) plasticity index

Ans:a

**39. Which of the following soils has more plasticity index ?**

- a) sand
- b) silt
- c) clay
- d) gravel

Ans:c

**40. At liquid limit, all soils possess**

- a) same shear strength of small magnitude
- b) same shear strength of large magnitude
- c) different shear strengths of small magnitude
- d) different shear strengths of large magnitude

Ans:a

**41. If the material of the base of the Casagrande liquid limit device on which the cup containing soil paste drops is**

softer than the standard hard rubber, then

- a) the liquid limit of soil always increases
- b) the liquid limit of soil always decreases
- c) the liquid limit of soil may increase
- d) the liquid limit of soil may decrease

Ans:a

**42. According to IS classification, the range of silt size particles is**

- a) 4.75 mm to 2.00 mm
- b) 2.00 mm to 0.425 mm
- c) 0.425 mm to 0.075 mm
- d) 0.075 mm to 0.002 mm

Ans:d

**43. Highway Research Board (HRB) classification of soils is based on**

- a) particle size composition
- b) plasticity characteristics
- c) both particle size composition and plasticity characteristics
- d) none of the above

Ans:c

**44. Inorganic soils with low compressibility are represented by**

- a) MH
- b) SL
- c) ML
- d) CH

Ans:c

**45. Sand particles are made of**

- a) rock minerals
- b) kaolinite
- c) illite
- d) montmorillonite

Ans:a

**46. The clay mineral with the largest swelling and shrinkage characteristics is**

- a) kaolinite
- b) illite
- c) montmorillonite
- d) none of the above

Ans:c

**47. Dispersed type of soil structure is an arrangement comprising particles having**

- a) face to face or parallel orientation
- b) edge to edge orientation
- c) edge to face orientation
- d) all of the above

Ans:a

**48. Effective stress is**

- a) the stress at particles contact
- b) a physical parameter that can be measured
- c) important because it is a function of engineering properties of soil
- d) all of the above

Ans:c

**49. Rise of water table above the ground surface causes**

- a) equal increase in pore water pressure and total stress

- b) equal decrease in pore water pressure and total stress
- c) increase in pore water pressure but decrease in total stress
- d) decrease in pore water pressure but increase in total stress

Ans:a

**50. The total and effective stresses at a depth of 5 m below the top level of water in a swimming pool are respectively**

- a) zero and zero
- b) 0.5 kg/cm<sup>2</sup> and zero
- c) 0.5 kg/cm<sup>2</sup> and 0.5 kg/cm<sup>2</sup>
- d) 1.0 kg/cm<sup>2</sup> and 0.5 kg/cm<sup>2</sup>

Ans:b

**51. If the water table rises upto ground surface, then the**

- a) effective stress is reduced due to decrease in total stress only but pore water pressure does not change
- b) effective stress is reduced due to increase in pore water pressure only but total stress does not change
- c) total stress is reduced due to increase in pore water pressure only but effective stress does not change
- d) total stress is increased due to decrease in pore water pressure but effective stress does not change

Ans:b

**53. Quick sand is a**

- a) type of sand
- b) flow condition occurring in cohesive soils
- c) flow condition occurring in cohesionless soils
- d) flow condition occurring in both cohesive and cohesionless soils

Ans:a

**54. The hydraulic head that would produce a quick condition in a sand stratum of thickness 1.5 m, specific gravity 2.67 and voids ratio 0.67 is equal to**

- a) 1.0m
- b) 1.5 m
- c) 2.0 m
- d) 3m

Ans:b

**55. Physical properties of a permeant which influence permeability are**

- a) viscosity only
- b) unit weight only
- c) both viscosity and unit weight
- d) none of the above

Ans:c

**56. Select the correct statement.**

- a) The greater the viscosity, the greater is permeability.
- b) The greater the unit weight, the greater is permeability.
- c) The greater the unit weight, the smaller is permeability.
- d) Unit weight does not affect per-meability.

Ans:b

**57. Effective stress on soil**

- a) increases voids ratio and decreases permeability
- b) increases both voids ratio and permeability
- c) decreases both voids ratio and permeability
- d) decreases voids ratio and increases permeability

Ans:c

**58. If the permeability of a soil is 0.8 mm/sec, the type of soil is**

- a) gravel
- b) sand
- c) silt
- d) clay

Ans:b

**59. Which of the following methods is more suitable for the determination of permeability of clayey soil ?**

- a) constant head method
- b) falling head method
- c) horizontal permeability test
- d) none of the above

Ans:b

**60. Which of the following methods is best suited for determination of permeability of coarse-grained soils ?**

- a) constant head method

- b) falling head method
- c) both the above
- d) none of the above

Ans:a

**61. Due to a rise in temperature, the viscosity and the unit weight of the percolating fluid are reduced to 60% and 90% respectively.**

**If other things remain constant, the coefficient of permeability**

- a) increases by 25%
- b) increases by 50%
- c) increases by 33.3%
- d) decreases by 33.3%

Ans:b

**62. Coefficient of permeability of soil**

- a) does not depend upon temperature
- b) increases with the increase in temperature
- c) increases with the decrease in temperature
- d) none of the above

Ans:b

**63. The average coefficient of permeability of natural deposits**

- a) parallel to stratification is always greater than that perpendicular to stratification
- b) parallel to stratification is always less than that perpendicular to stratification
- c) is always same in both directions
- d) parallel to stratification may or may not be greater than that perpendicular to stratification

Ans:a

**64. The total discharge from two wells situated near to each other is**

- a) sum of the discharges from individual wells
- b) less than the sum of the discharges from individual wells
- c) greater than the sum of the discharges from individual wells
- d) equal to larger of the two discharges from individual wells

Ans:b

**65. The flownet for an earthen dam with 30 m water depth consists of 25 potential drops and 5 flow channels. The coefficient of permeability of dam material is 0.03 mm/sec. The discharge per meter length of dam is**

- a) 0.00018 m<sup>3</sup>/sec
- b) 0.0045 m<sup>3</sup>/sec
- c) 0.18m<sup>3</sup>/sec
- d) 0.1125m<sup>3</sup>/sec

Ans:a

**66. The most suitable method for drainage of fine grained cohesive soils is**

- a) well point system
- b) vacuum method
- c) deep well system
- d) electroosmosis method

Ans:d

**67. Total number of stress components at a point within a soil mass loaded at its boundary is**

- a) 3
- b) 6
- c) 9
- d) 16

Ans:c

### ***Soil Mechanics and Foundation Engineering Interview Questions***

**76. The slope of isochrone at any point at a given time indicates the rate of change of**

- a) effective stress with time
- b) effective stress with depth
- c) pore water pressure with depth
- d) pore water pressure with time

Ans:c

**77. Within the consolidation process of a saturated clay**

- a) a gradual increase in neutral pressure and a gradual decrease in effective pressure takes place and sum of the two is constant
- b) a gradual decrease in neutral pressure and a gradual increase in effective pressure takes place and sum of the two is constant

- c) both neutral pressure and effective pressure decrease
- d) both neutral pressure and effective pressure increase

Ans:b

**78. The value of compression index for a remoulded sample whose liquid limit is 50% is**

- a) 0.028
- b) 0.28
- c) 0.36
- d) 0.036

Ans:b

**79. Which one of the following clays behaves like a dense sand ?**

- a) over-consolidated clay with a high over-consolidation ratio
- b) over-consolidated clay with a low over-consolidation ratio
- c) normally consolidated clay
- d) under-consolidated clay

Ans:a

**80. Coefficient of consolidation of a soil is affected by**

- a) compressibility
- b) permeability
- c) both compressibility and permeability
- d) none of the above

Ans:c

**81. Degree of consolidation is**

- a) directly proportional to time and inversely proportional to drainage path
- b) directly proportional to time and inversely proportional to square of drainage path
- c) directly proportional to drainage path and inversely proportional to time
- d) directly proportional to square of drainage path and inversely proportional to time

Ans:b

**82. Time factor for a clay layer is**

- a) a dimensional parameter
- b) directly proportional to permeability of soil



- c) inversely proportional to drainage path
- d) independent of thickness of clay layer

Ans:b

**84. Clay layer A with single drainage and coefficient of consolidation  $C_v$  takes 6 months to achieve 50% consolidation. The time taken by clay layer B of the same thickness with double drainage and coefficient of consolidation  $C_v/2$  to achieve the same degree of consolidation is**

- a) 3 months
- b) 6 months
- c) 12 months
- d) 24 months

Ans:a

**85. Coefficient of consolidation for clays normally**

- a) decreases with increase in liquid limit
- b) increases with increase in liquid limit
- c) first increases and then decreases with increase in liquid limit
- d) remains constant at all liquid limits

Ans:a

**86. Direct measurement of permeability of the specimen at any stage of loading can be made**

- a) only in fixed ring type consolidometer
- b) only in floating ring type consolidometer
- c) both (a) and (b)
- d) none of the above

Ans:a

**87. Compressibility of sandy soils is**

- a) almost equal to that of clayey soils
- b) much greater than that of clayey soils
- c) much less than that of clayey soils
- d) none of the above

Ans:c

**88. Select the correct statement.**

- a) coefficient of compressibility of an over-consolidated clay is less than that of a normally consolidated clay

- b) coefficient of compressibility of an over-consolidated clay is greater than that of a normally consolidated clay
- c) coefficient of compressibility is constant for any clay
- d) none of the above

Ans:a

**89. Coefficient of compressibility is**

- a) constant for any type of soil
- b) different for different types of soils and also different for a soil under different states of consolidation
- c) different for different types of soils but same for a soil under different states of consolidation
- d) independent of type of soil but depends on the stress history of soil

Ans:b

**90. The ultimate consolidation settlement of a structure resting on a soil**

- a) decreases with the increase in the initial voids ratio
- b) decreases with the decrease in the plastic limit
- c) increases with the increase in the initial voids ratio
- d) increases with the decrease in the porosity of the soil

Ans:a

**91. The ultimate consolidation settlement of a soil is**

- a) directly proportional to the voids ratio
- b) directly proportional to the compression index
- c) inversely proportional to the compression index
- d) none of the above

Ans:b

**92. A normally consolidated clay settled 10 mm when effective stress was increased from 100 kN/m<sup>2</sup> to 200 kN/m<sup>2</sup>. If the effective stress is further increased from 200 kN/m<sup>2</sup> to 400 kN/m<sup>2</sup>, then the settlement of the same clay is**

- a) 10 mm
- b) 20 mm
- c) 40 mm
- d) none of the above

Ans:a

**93. Coarse grained soils are best compacted by a**

- a) drum roller
- b) rubber tyred roller
- c) sheep's foot roller
- d) vibratory roller

Ans:d

**94. With the increase in the amount of compaction energy**

- a) optimum water content increases but maximum dry density decreases
- b) optimum water content decreases but maximum dry density increases
- c) both optimum water content and maximum dry density increase
- d) both optimum water content and maximum dry density decrease[ES 93]

Ans:b

**95. The maximum dry density upto which any soil can be compacted depends upon**

- a) moisture content only
- b) amount of compaction energy only
- c) both moisture content and amount of compaction energy
- d) none of the above

Ans:c

**97. For better strength and stability, the fine grained soils and coarse grained soils are compacted respectively as**

- a) dry of OMC and wet of OMC
- b) wet of OMC and dry of OMC
- c) wet of OMC and wet of OMC
- d) dry of OMC and dry of OMC where OMC is optimum moisture content

Ans:b

**98. Select the incorrect statement.**

- a) Effective cohesion of a soil can never have a negative value.
- b) Effective angle of internal friction for coarse grained soils is rarely below 30°.
- c) Effective angle of internal friction for a soil increases as state of compact-ness increases.
- d) Effective angle of internal friction is a complicated function of

mineralogy and clay size content.

Ans:a

**99. For a loose sand sample and a dense sand sample consolidated to the same effective stress**

- a) ultimate strength is same and also peak strength is same
- b) ultimate strength is different but peak strength is same
- c) ultimate strength is same but peak strength of dense sand is greater than that of loose sand
- d) ultimate strength is same but peak

Ans:c

**100. The shear strength of a soil**

- a) is directly proportional to the angle of internal friction of the soil
- b) is inversely proportional to the angle of internal friction of the soil
- c) decreases with increase in normal stress
- d) decreases with decrease in normal stress

Ans:d

**101. In a consolidated drained test on a normally consolidated clay, the volume of the soil sample during shear**

- a) decreases
- b) increases
- c) remains unchanged
- d) first increases and then decreases

Ans:a

**102. Skempton's pore pressure coefficient B for saturated soil is**

- a) 1
- b) zero
- c) between 0 and 1
- d) greater than 1 [CS 95]

Ans:a

**103. Shear strength of a soil is a unique function of**

- a) effective stress only
- b) total stress only
- c) both effective stress and total stress

d) none of the above

Ans:a

**104. In a deposit of normally consolidated clay**

a) effective stress increases with depth but water content of soil and un-drained strength decrease with depth

b) effective stress and water content increase with depth but undrained strength decreases with depth

c) effective stress and undrained strength increase with depth but water content decreases with depth

d) effective stress, water content and undrained strength decrease with depth

Ans:c

**105. Select the incorrect statement.**

Effective angle of shearing resistance

a) increases as the size of particles increases

b) increases as the soil gradation improves

c) is limited to a maximum value of  $45^\circ$

d) is rarely more than  $30^\circ$  for fine grained soil

Ans:c

**106. Unconfined compressive strength test is**

a) undrained test

b) drained test

c) consolidated undrained test

d) consolidated drained test

Ans:a

**107. A cylindrical specimen of saturated soil failed under an axial vertical stress of  $100\text{kN/m}^2$  when it was laterally unconfined. The failure plane was inclined to the horizontal plane at an angle of  $45^\circ$ .**

**The values of cohesion and angle of internal friction for the soil are respectively**

a)  $0.5\text{ N/mm}^2$  and  $30^\circ$

b)  $0.05\text{ N/mm}^2$  and  $0^\circ$

c)  $0.2\text{ N/mm}^2$  and  $0^\circ$

d)  $0.05\text{ N/mm}^2$  and  $45^\circ$

Ans:b

**109. The angle that Coulomb's failure envelope makes with the horizontal is called**

- a) cohesion
- b) angle of internal friction
- c) angle of repose
- d) none of the above

Ans:a

**111. If a cohesive soil specimen is subjected to a vertical compressive load, the inclination of the cracks to the horizontal is**

- a)  $90^\circ$
- b)  $45^\circ$
- c)  $22.5^\circ$
- d)  $0^\circ$

Ans:b

**112. Select the incorrect statement.**

- a) In a direct shear box test, the plane of shear failure is predetermined.
- b) Better control is achieved on the drainage of the soil in a triaxial compression test.
- c) Stress distribution on the failure plane in the case of triaxial compression test is uniform.
- d) Unconfined compression test can be carried out on all types of soils.

Ans:d

**113. If the shearing stress is zero on two planes, then the angle between the two planes is**

- a)  $45^\circ$
- b)  $90^\circ$
- c)  $135^\circ$
- d)  $225^\circ$

Ans:b

**114. In the triaxial compression test, the application of additional axial stress (i.e. deviator stress) on the soil specimen produces shear stress on**

- a) horizontal plane only
- b) vertical plane only

- c) both horizontal and vertical planes
- d) all planes except horizontal and vertical planes

Ans:d

**116. In a triaxial compression test when drainage is allowed during the first stage (i. e. application of cell pressure) only and not during the second stage (i.e. application of deviator stress at constant cell pressure), the test is known as**

- a) consolidated drained test
- b) consolidated undrained test
- c) unconsolidated drained test
- d) unconsolidated undrained test

Ans:b

**120. During the first stage of triaxial test when the cell pressure is increased from 0.10 N/mm<sup>2</sup> to 0.26 N/mm<sup>2</sup>, the pore water pressure increases from 0.07 N/mm<sup>2</sup> to 0.15 N/mm<sup>2</sup>. Skempton's pore pressure parameter B is**

- a) 0.5
- b) -0.5
- c) 2.0
- d) - 2.0

Ans:a

**121. Sensitivity of a soil can be defined as**

- a) percentage of volume change of soil under saturated condition
- b) ratio of compressive strength of unconfined undisturbed soil to that of soil in a remoulded state
- c) ratio of volume of voids to volume of solids
- d) none of the above

Ans:b

**122. Rankine's theory of earth pressure assumes that the back of the wall is**

- a) plane and smooth
- b) plane and rough
- c) vertical and smooth
- d) vertical and rough

Ans:c

**123. The coefficient of active earth pressure for a loose sand having an angle of internal friction of  $30^\circ$  is**

- a)  $1/3$
- b) 3
- c) 1
- d)  $1/2$

Ans:a

**124. The major principal stress in an element of cohesionless soil within the backfill of a retaining wall is**

- a) vertical if the soil is in an active state of plastic equilibrium
- b) vertical if the soil is in a passive state of plastic equilibrium
- c) inclined at  $45^\circ$  to the vertical plane
- d) none of the above

Ans:a

**126. The effect of cohesion on a soil is to**

- a) reduce both the active earth pressure intensity and passive earth pressure intensity
- b) increase both the active earth pressure intensity and passive earth pressure intensity
- c) reduce the active earth pressure intensity but to increase the passive earth pressure intensity
- d) increase the active earth pressure intensity but to reduce the passive earth pressure intensity [GATE 99]

Ans:c

**127. A retaining wall 6m high supports a backfill with a surcharge angle of  $10^\circ$ . The back of the wall is inclined to the vertical at a positive batter angle of  $5^\circ$ . If the angle of wall friction is  $7^\circ$ , then the resultant active earth pressure will act at a distance of 2 m above the base and inclined to the horizontal at an angle of**

- a)  $7^\circ$
- b)  $10^\circ$
- c)  $12^\circ$
- d)  $17^\circ$

Ans:c

**128. Coefficient of earth pressure at rest is**

- a) less than active earth pressure but greater than passive earth



pressure

- b) greater than active earth pressure but less than passive earth pressure
- c) greater than both the active earth pressure and passive earth pressure

d) less than both the active and passive earth pressures

Ans:b

### 137. Bishop's method of stability analysis

- a) is more conservative
- b) neglects the effect of forces acting on the sides of the slices
- c) assumes the slip surface as an arc of a circle
- d) all of the above

Ans:c

### 138. Allowable bearing pressure for a foundation depends upon

- a) allowable settlement only
- b) ultimate bearing capacity of soil only
- c) both allowable settlement and ultimate bearing capacity
- d) none of above

Ans:c

### 142. The rise of water table below the foundation influences the bearing capacity of soil mainly by reducing

- a) cohesion and effective angle of shearing resistance
- b) cohesion and effective unit weight of soil
- c) effective unit weight of soil and effective angle of shearing resistance
- d) effective angle of shearing resistance

Ans:b

### 143. Terzaghi's general bearing capacity formula for a strip footing

$(C N_c + \gamma D N_q + 0.5 \gamma N_{TB})$  gives

- a) safe bearing capacity
- b) net safe bearing capacity
- c) ultimate bearing capacity
- d) net ultimate bearing capacity where C = unit cohesion  
Y = unit weight of soil D = depth of foundation B = width of

foundation  $N_c$ ,  $N_q$ ,  $N_{\gamma}$  = bearing capacity factors

Ans:c

**144. Terzaghi's bearing capacity factors  $N_c$ ,  $N_q$  and  $N_{\gamma}$  are functions of**

- a) cohesion only
- b) angle of internal friction only
- c) both cohesion and angle of internal friction
- d) none of the above

Ans:b

**145. In the plate loading test for determining the bearing capacity of soil, the size of square bearing plate should be**

- a) less than 300 mm
- b) between 300 mm and 750 mm
- c) between 750 mm and 1 m
- d) greater than 1 m

Ans:b

**146. Select the incorrect statement.**

- a) Bearing capacity of a soil depends upon the amount and direction of load.
- b) Bearing capacity of a soil depends on the type of soil.
- c) Bearing capacity of a soil depends upon shape and size of footing.
- d) Bearing capacity of a soil is independent of rate of loading.

Ans:a

**147. A 600 mm square bearing plate settles by 15 mm in plate load test on a cohesionless soil under an intensity of loading of 0.2 N/mm<sup>2</sup>. The settlement of a prototype shallow footing 1 m square under the same intensity of loading is**

- a) 15 mm
- b) between 15 mm and 25 mm
- c) 25 mm
- d) greater than 25 mm

Ans:b

**148. A 300 mm square bearing plate settles by 15 mm in a plate load test on a cohesive soil when the intensity of loading is 0.2 N/mm<sup>2</sup>. The settlement of a prototype**

**shallow footing 1 m square under the same intensity of loading is**

- a) 15 mm
- b) 30 mm
- c) 50 mm
- d) 167 mm

Ans:c

**149. Rise of water table in cohesionless soils upto ground surface reduces the net ultimate bearing capacity approximately by**

- a) 25%
- b) 50%
- c) 75%
- d) 90%

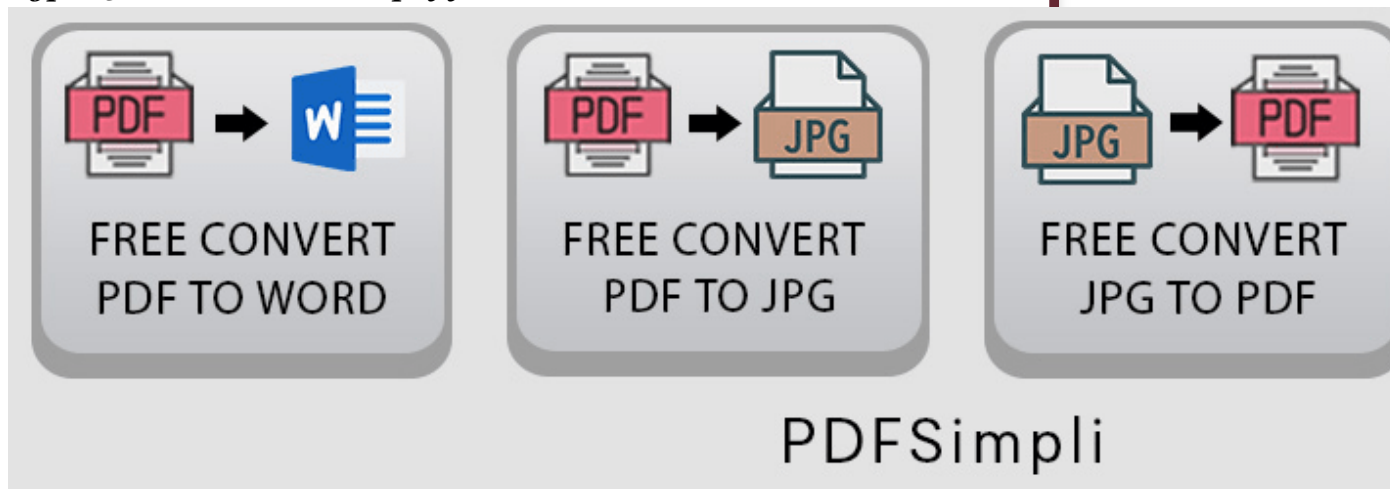
Ans:b

**150. Contact pressure beneath a rigid footing resting on cohesive soil is**

- a) less at edges compared to middle
- b) more at edges compared to middle
- c) uniform throughout
- d) none of the above

Ans:b

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