

Online Examinations (Even Sem/Part-I/Part-II Examinations 2020 - 2021)

Course Name - Geotechnical Engineering I

Course Code -DCE402

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Answer all the questions. Each question carry one mark.

9. 1.Water content is given by:

Mark only one oval.

- Weight of water/mass of soil
- Mass of water/mass of solid
- Mass of water/mass of soil
- Mass of water/weight of solid

10. 2. According to Darcy's Law:

Mark only one oval.

$q=iA$

$q=kA$

$q \propto iA$

$q \propto kA$

11. 3. _____ index is used to find settlement of soil.

Mark only one oval.

Compression

Expansion

Recompression

Reloading

12. 4. _____ is the measure of loss of strength with remoulding, with water content unchanged.

Mark only one oval.

Compressibility

Sensitivity

Stability

Thixotropy

13. 5. Fine particles are those particles with size less than _____ mm diameter.

Mark only one oval.

0.023

0.09

0.075

4.75

14. 6. Percentage air voids is denoted as:

Mark only one oval.

v

na

s

av

15. 7. Most soils have a particle density of about:

Mark only one oval.

2.6 g/cc

2.9 g/cc

2.5 g/cc

2.7 g/cc

16. 8. In oven drying method for determination of water content, temperature maintained is:

Mark only one oval.

- 100-105°C
- 150-160°C
- 105-110°C
- 110-120°C

17. 9. Loose soil has a relative density within a range of:

Mark only one oval.

- 60-85
- 85-100
- 10-35
- 35-60

18. 10. How many tests in the lab can be performed to get permeability of soil?

Mark only one oval.

- 5
- 4
- 3
- 2

19. 11.How many types of pores are present in a soil mass?

Mark only one oval.

6

3

5

4

20. 12.What are the Soil properties, which are influenced by soil structure?

Mark only one oval.

Permeability

Compressibility

Shear strength

All of the mentioned

21. 13.Soil structure usually defines _____

Mark only one oval.

Arrangement of soil particles and Stage of aggregation of soil particle in soil

Composition of the soil mass

None of the mentioned

All of the mentioned

22. 14. An arrangement composed of soil particles having a parallel orientation is _____

Mark only one oval.

- Dispersed
- Coarse grained skeleton
- Honey comb
- Single grained

23. 15. The soil structure, having comparative loose stable structure is _____

Mark only one oval.

- Honey comb
- Cohesive matrix
- Flocculent
- Single grained

24. 16. Honey comb Cohesive matrix Flocculent Single grained

Mark only one oval.

- Soil forming honey comb structure
- Coarse grain forming a skeleton
- Soil oriented 'edge-to-edge' with one another
- None of the mentioned

25. 17. When compacted dry of optimum, the structure of clay is always _____

Mark only one oval.

- Flocculated
- Dispersed
- Disoriented
- Honey comb shaped

26. 18. The shear strength of compacted clays depends upon _____

Mark only one oval.

- Dry density
- Water content
- Degree of saturation
- Addition of admixtures

27. 19. What is the maximum dry density for a soil sample having sp. gr. of 2.7 and OMC=16 %?

Mark only one oval.

- 3.0 g/cm³
- 1.88 g/cm³
- 0.562 g/cm³
- 1.00 g/cm³

28. 20. A cohesive soil yields a maximum dry density of 1.8 g/cc at an OMC of 16 % during a standard proctor test. What will be its degree of saturation? Take $G=2.65$

Mark only one oval.

- 1
- 0.6045
- 0.4327
- 0.8979

29. 21. The consistency (or) relative consistency (I_{ce}) is given by the formula _____

Mark only one oval.

- $IC = WL - W/IP$
- $IC = W - WL/IP$
- $IC = W - WL/IP$
- $IC = W - WP/IP$

30. 22. The Swedish agriculturist who divided the entire range of consistency from liquid to solid states is _____

Mark only one oval.

- Dupuit's
- Laplace
- Boussinesq
- Atterberg

31. 23. According to Goldschmidt theory, the plasticity in soil is due to _____

Mark only one oval.

- Electro-magnetic charges
- Smooth surface
- All of the mentioned
- None of the mentioned

32. 24. In consistency of soil, the limits are expressed in terms of _____

Mark only one oval.

- Per cent water content
- Area
- Volume
- All of the mentioned

33. 25. Based on Allen Hazen experiments, permeability can be expressed as _____

Mark only one oval.

- $K = CD^{102}$
- $K = CD^{210}$
- $K = DC^{210}$
- $K = DC^{102}$

34. 26. Physical permeability of a soil K_p is related to the coefficient of permeability by the equation _____

Mark only one oval.

- $K_p = k\eta$
- $K_p = k\eta/\gamma_w$
- $K_p = k/\eta$
- $K_p = k \gamma_w$

35. 27. What is the constant value of a and b in Loudon's empirical formula " $\log_{10}(K_s s^2) = a + bn$ "?

Mark only one oval.

- 1 and 0
- 1.515 and 1.365
- 1.365 and 1.515
- 0 and 1

36. 28. What is the effect of adsorbed water on the permeability of soil?

Mark only one oval.

- Structural arrangement is varied
- Reduced degree of saturation
- Size of the particles is diminished
- Reduces the pore size

37. 29.The effect of structural disturbance is on permeability is more in _____

Mark only one oval.

- Fine-grained soil
- Coarse grained soil
- Clay soil
- All of the mentioned

38. 30.How do degree of saturation effect permeability of soil?

Mark only one oval.

- By reducing the pore size
- By entrapping air in the voids
- Not allowing soil particles to move freely
- By changing the void ratio

39. 31.Which of the following formula is used in Falling head permeability test?

Mark only one oval.

- Jacky's formula
- Louden's formula
- Darcy's law
- Kozney's formula

40. 32. In constant permeability test, the length of specimen is measured by _____

Mark only one oval.

- Calculating the difference in water level
- Using Piezometric tube
- Using measuring scale
- None of the mentioned

41. 33. The laboratory observation falling head test consist of measurements of _____

Mark only one oval.

- h_1 at an interval of t_1 and h_2 at an interval of t_2
- Only t_1 and t_2
- None of the mentioned
- All of the mentioned

42. 34. In falling head permeability test, change in the head at a time interval dt is denoted as _____

Mark only one oval.

- dh
- $-dh$
- h
- $-h$

43. 35.The seepage analysis is done on the assumption of _____

Mark only one oval.

- Flow is laminar and Darcy's law is valid
- Seepage of water
- None of the mentioned
- All of the mentioned

44. 36.Fine grained cohesive soil can be drained or stabilized by _____

Mark only one oval.

- Vacuum method
- Electro-osmosis method
- Shallow well system
- Well point system

45. 37.A complete design of dewatering system consist of _____

Mark only one oval.

- Spacing of wells
- Penetration of wells
- Pumping capacities
- All of the mentioned

46. 38. In discharge equation given by Chapman $q_p = kba(H - h_o)/L + EA$, EA refers to

Mark only one oval.

- Coefficient of permeability
- Electric gradient
- Extra length factor
- Efficiency of permeability of soil

47. 39. For fine-grained soil what type of dewatering system can be used?

Mark only one oval.

- Electro-osmosis method
- Shallow well system
- Deep well system
- Vacuum method

48. 40. For an anisotropic soil, the permeability in the horizontal and vertical direction are k_x and k_y respectively. What will be the effective permeability of the soil?

Mark only one oval.

- $k_x + k_y$
- $k_x k_y$
- $\sqrt{k_x k_y}$
- k_x / k_y

49. 41. A soil mass has $k_x = 8 \times 10^{-7} \text{ cm/s}$ and $k_y = 4 \times 10^{-7} \text{ cm/s}$. The effective permeability of the soil is _____

Mark only one oval.

- $4.6 \times 10^{-7} \text{ cm/s}$
 $6.6 \times 10^{-7} \text{ cm/s}$
 $5.6 \times 10^{-7} \text{ cm/s}$
 $7.6 \times 10^{-7} \text{ cm/s}$

50. 42. If a fully saturated soil mass has a water content of 100%, then its void ratio is _____

Mark only one oval.

- less than the specific gravity
 greater than the specific gravity
 equal to specific gravity
 does not depend on specific gravity

51. 43. The un-drained test is carried out on sample of clay, silt, and peat to determine _____

Mark only one oval.

- Shear Strength of natural ground and Sensitivity
 Pore pressure
 None of the mentioned
 All of the mentioned

52. 44.The consolidated-un drained test can be performed in _____ methods.

Mark only one oval.

3

2

4

1

53. 45.The change in the pore pressure during an un-drained shear can be explained by _____

Mark only one oval.

Lateral pressure

Effective stress

Pore pressure parameter

Mohr's circle

54. 46.The value of pore pressure parameter, at failure for saturated clay is _____

Mark only one oval.

1.2 to 2.5

2 to 3

0.3 to 0.7

0.7 to 1.3

55. 47.If the pore pressure is measured during un-drained stage of the test, the result can be expressed in terms of _____

Mark only one oval.

- C' and ϕ
- c_u
- None of the mentioned
- All of the mentioned

56. 48.What will be the shearing resistance of a sample of clay in an unconfined compression test, falls under a load of 150 N? Take change of cross-section $A_f=2181.7 \text{ mm}^2$.

Mark only one oval.

- 68.75 kN/m²
- 34.38 kN/m²
- 11.35 kN/m²
- 0.6875 kN/m²

57. 49.Which of the following shear test is developed based on drainage conditions?

Mark only one oval.

- Quick test and Consolidated un drained test
- Direct shear test
- None of the mentioned
- All of the mentioned

58. 50.The commonly used apparatus used for performing shear box test is _____

Mark only one oval.

- Shear-box apparatus
- Bishop's pore pressure apparatus
- Tri axial shear test apparatus
- None of the mentioned

59. 51.The drained test is also known as _____

Mark only one oval.

- Direct shear test
- Slow test
- Vane shear test
- Quick test

60. 52.The shearing of cohesive soil in drained test requires _____ days.

Mark only one oval.

- 2
- 1 to 2
- 2 to 5
- 1

61. 53. In direct shear test, the soil load is subjected to more stress at _____

Mark only one oval.

- Centre
- Edges
- Top and bottom
- All of the mentioned

62. 54. The shear strength in cohesion less soil is due to _____

Mark only one oval.

- Internal friction
- Cohesion
- Inter granular friction
- Inter particle force

63. 55. The failure condition for a soil can be expressed in terms of limiting shear stress, called _____

Mark only one oval.

- Principal stresses and Shear strength
- Shearing resistances
- None of the mentioned
- All of the mentioned

64. 56. Major principal stress in a soil is represented by the symbol _____

Mark only one oval.

σ_1

σ_2

σ_3

σ_4

65. 57. The maximum shear stress τ_{max} , for a soil mass is equal to _____

Mark only one oval.

$(\sigma_1 - \sigma_3)/2$

$(\sigma_1 + \sigma_3)/2$

$(\sigma_1 \times \sigma_3)/2$

$(\sigma_3 - \sigma_1)/2$

66. 58. Stress component on planes of a loaded soil mass depends upon _____

Mark only one oval.

Stress acting on plane

Direction of plane

Shearing resistance

All of the mentioned

67. 59. Dry density of soil is increased by _____

Mark only one oval.

- compaction
- swelling
- bulking
- addition of excess of water

68. 60. In 1933, _____ showed the existence of relationship between soil water content and degree of dry density.

Mark only one oval.

- Terzaghi
- Skempton
- Darcy
- Proctor

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