



BRAINWARE UNIVERSITY

Term End Examination 2021 - 22
Programme – Diploma in Civil Engineering
Course Name – Geotechnical Engineering I
Course Code - DCE402
(Semester IV)

Time allotted : 1 Hrs.15 Min.

Full Marks : 60

[The figure in the margin indicates full marks.]

Group-A

(Multiple Choice Type Question)

1 x 60=60

Choose the correct alternative from the following :

- (1) Water content is given by:
- | | |
|---------------------------------|----------------------------------|
| a) Weight of water/mass of soil | b) Mass of water/mass of solid |
| c) Mass of water/mass of soil | d) Mass of water/weight of solid |
- (2) Triaxial compression test is used to find _____ of soil.
- | | |
|-------------------------|-------------------|
| a) Compressive strength | b) Permeability |
| c) Specific gravity | d) Shear strength |
- (3) _____ index is used to find settlement of soil.
- | | |
|------------------|--------------|
| a) Compression | b) Expansion |
| c) Recompression | d) Reloading |
- (4) _____ is the measure of loss of strength with remoulding, with water content unchanged.
- | | |
|--------------------|----------------|
| a) Compressibility | b) Sensitivity |
| c) Stability | d) Thixotropy |
- (5) Fine particles are those particles with size less than _____ mm diameter.
- | | |
|----------|---------|
| a) 0.023 | b) 0.09 |
| c) 0.075 | d) 4.75 |
- (6) Most soils have a particle density of about:
- | | |
|-------------|-------------|
| a) 2.6 g/cc | b) 2.9 g/cc |
| c) 2.5 g/cc | d) 2.7 g/cc |

- (7) In oven drying method for determination of water content, temperature maintained is:
- a) 100-105°C
 - b) 150-160°C
 - c) 105-110°C
 - d) 110-120°C
- (8) Loose soil has a relative density within a range of:
- a) 60-85
 - b) 85-100
 - c) 10-35
 - d) 35-60
- (9) _____ apparatus is used to test liquid limit of a soil.
- a) Mohr
 - b) Casagrande
 - c) Otto
 - d) Terzaghi
- (10) What are the Soil properties, which are influenced by soil structure?
- a) Permeability
 - b) Compressibility
 - c) Shear strength
 - d) All of the mentioned
- (11) Soil structure usually defines _____
- a) Arrangement of soil particles and Stage of aggregation of soil particle in soil
 - b) Composition of the soil mass
 - c) None of the mentioned
 - d) All of the mentioned
- (12) An arrangement composed of soil particle having a parallel orientation is _____
- a) Dispersed
 - b) Coarse grained skeleton
 - c) Honey comb
 - d) Single grained
- (13) The soil structure, having comparative loose stable structure is _____
- a) Honey comb
 - b) Cohesive matrix
 - c) Flocculent
 - d) Single grained
- (14) When compacted dry of optimum, the structure of clay is always _____
- a) Flocculated
 - b) Dispersed
 - c) Disoriented
 - d) Honey comb shaped
- (15) The flocculated structure of compacted dry soil is broken due to _____
- a) High strains
 - b) Low water content
 - c) Low strains
 - d) Dry density
- (16) The shear strength of compacted clays depends upon _____
- a) Dry density
 - b) Water content
 - c) Degree of saturation
 - d) Addition of admixtures
- (17) What is the maximum dry density for a soil sample having sp. gr. of 2.7 and OMC=16 %?
- a) 3.0 g/cm³
 - b) 1.88 g/cm³
 - c) 0.562 g/cm³
 - d) 1.00 g/cm³
- (18) 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 $G=2.65$
- a) 1
 - b) 0.6045
 - c) 0.4327
 - d) 0.8979
- (19) The property of a soil which allows it to be deformed rapidly, without rupture is _____

- a) Elasticity
c) Tenacity
- b) Plasticity
d) None of the mentioned
- (20) The ratio of liquid limit, minus the natural water content to the plasticity index of the soil is _____
- a) Consistency index
c) All of the mentioned
- b) Plasticity index
d) None of the mentioned
- (21) The consistency (or) relative consistency (Ice) is given by the formula _____
- a) $IC = WL - W/IP$
c) $IC = W - WL/IP$
- b) $IC = W - WL/IP$
d) $IC = W - WP/IP$
- (22) The Swedish agriculturist who divided the entire range of consistency from liquid to solid states is _____
- a) Dupuit's
c) Boussinesq
- b) Laplace
d) Atterberg
- (23) Which of the following is not useful for engineering purpose, as proposed by Atterberg?
- a) Plastic limit
c) Solid limit
- b) Liquid limit
d) Shrinkage limit
- (24) Clay does not become plastic, when mixed with _____
- a) Soap solution
c) Oil
- b) Kerosene
d) None of the mentioned
- (25) In consistency of soil, the limits are expressed in terms of _____
- a) Per cent water content
c) Volume
- b) Area
d) All of the mentioned
- (26) Which of the following is not considered as one of the state, as divided by Atterberg?
- a) Solid state
c) Semi-solid state
- b) Gaseous state
d) Liquid state
- (27) Which of the following factors affects the permeability of soil?
- a) Grain size
c) Void ratio of soils
- b) Properties of pore fluid
d) All of the mentioned
- (28) Loudon's experiments demonstrated the relationship between _____
- a) Permeability and specific surface
c) Permeability and adsorbed water
- b) Permeability and grain size
d) Permeability and volume
- (29) What is the relationship between permeability and viscosity of water?
- a) Directly proportional
c) Both are equal
- b) Inversely proportional
d) None of the mentioned
- (30) What is the approximate value, which can be taken as void ratio occupied by adsorbed water?
- a) 1
c) 0.1
- b) 0
d) 10
- (31) The structural arrangement of soil Particle vary depending upon _____
- a) Method of deposition and Compacting the soil
b) Degree of saturation

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- a) Dupuit and Forchheimer
c) None of the mentioned
- b) Darcy
d) All of the mentioned
- (44) A soil mass has $k_x=8 \times 10^{-7}$ cm/s and $k_y=4 \times 10^{-7}$ cm/s. The effective permeability of the soil is _____
- a) 4.6×10^{-7} cm/s
c) 5.6×10^{-7} cm/s
- b) 6.6×10^{-7} cm/s
d) 7.6×10^{-7} cm/s
- (45) If a fully saturated soil mass has a water content of 100%, then its void ratio is _____
- a) less than the specific gravity
c) equal to specific gravity
- b) greater than the specific gravity
d) does not depend on specific gravity
- (46) The un-drained test is carried out on sample of clay, silt, and peat to determine _____
- a) Shear Strength of natural ground and Sensitivity
c) None of the mentioned
- b) Pore pressure
d) All of the mentioned
- (47) The consolidated-un drained test can be performed in _____ methods.
- a) 3
c) 4
- b) 2
d) 1
- (48) Which of the following cannot be obtained by using un-drained test?
- a) Effective stress failure envelope
c) sensitivity
- b) Shear strength
d) All of the mentioned
- (49) The change in the pore pressure during an un-drained shear can be explained by _____
- a) Lateral pressure
c) Pore pressure parameter
- b) Effective stress
d) Mohr's circle
- (50) The value of pore pressure parameter, at failure for saturated clay is _____
- a) 1.2 to 2.5
c) 0.3 to 0.7
- b) 2 to 3
d) 0.7 to 1.3
- (51) If the pore pressure is measured during un-drained stage of the test, the result can be expressed in terms of _____
- a) C' and ϕ
c) None of the mentioned
- b) c_u
d) All of the mentioned
- (52) 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 $A_f=2181.7$ mm².
- a) 68.75 kN/m²
c) 11.35 kN/m²
- b) 34.38 kN/m²
d) 0.6875 kN/m²
- (53) Which of the following shear test is developed based on drainage conditions?
- a) Quick test and Consolidated un drained test
c) None of the mentioned
- b) Direct shear test
d) All of the mentioned
- (54) The commonly used apparatus used for performing shear box test is _____
- a) Shear-box apparatus
- b) Bishop's pore pressure apparatus

- c) Tri axial shear test apparatus
d) None of the mentioned
- (55) The drained test is also known as _____
a) Direct shear test
b) Slow test
c) Vane shear test
d) Quick test
- (56) The shearing of cohesive soil in drained test requires _____ days.
a) 2
b) 1 to 2
c) 2 to 5
d) 1
- (57) In direct shear test, the soil load is subjected to more stress at _____
a) Centre
b) Edges
c) Top and bottom
d) All of the mentioned
- (58) The shear strength in cohesion less soil is due to _____
a) Internal friction
b) Cohesion
c) Inter granular friction
d) Inter particle force
- (59) The failure condition for a soil can be expressed in terms of limiting shear stress, called _____
a) Principal stresses and Shear strength
b) Shearing resistances
c) None of the mentioned
d) All of the mentioned
- (60) The shear deformation of soil in a building can cause _____ of the following?
a) Sinking of footing
b) Slide in an earth embankment
c) Movement of wedge
d) All of the mentioned