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Q :) The water content of a soil remains unchanged during the entire test in-
[UKPSC AE 2013 PAPER-I]
A: Drained test
B: Consolidated undrained test
C: Unconsolidated undrained test
D: None of these

Q :) The suitable method of finding the shear strength of very plastic cohesive soils is by means of-
[OPSC AE-2016 (II)/OPSC AEE 2015 PAPER-I/Karnataka PSC AE 2015 Paper-II]
A: Cone test
B: Penetration test
C: Vane shear test
D: Torsional shear test

Q :) Considerable loss of shear strength due to shock or disturbance is exhibited by:
[GPSC AE Class 91&2) Paper-2 2017 ESE 2010]
A: Under-consolidated clays
B: Normally consolidated clays
C: Over consolidated clays
D: Organic soil

Q :) Shear strength of a soil is its
[GPSC AE (CLASS 1 & 2) 2019]
A: Minimum resistance to shear stress just before the failure
B: Minimum resistance to shear stresses just after the failure
C: Maximum resistance to shear stresses just before the failure
D: Maximum resistance to shear stresses just after the failure

Q :) Which of the following test is not used to measure the shear strength of soil?
[GPSC AE (class 1 & 2) 2019]
A: Triaxial compression test
B: Standard proctor test
C: Unconfined compression test
D: Vane shear test

Q :) If α is the angle between the direction of the failure and major principal plane, and ϕ is the angle of shearing resistance. Then the relationship between this two is [TNPSC AE 2019]

A: $\alpha = 90^0 - \frac{\phi}{2}$

B : $\alpha = 90^0 + \frac{\phi}{2}$

C : $\alpha = 45^0 - \frac{\phi}{2}$

D : $\alpha = 45^0 + \frac{\phi}{2}$

Q :) In a Mohr's circle, the shear stress τ_f on the plane of maximum obliquity is

[GPSC AE (CLASS 1 & 2) 2019]

A: Less than the maximum shear stress τ_{max}

B: More than the maximum shear stress τ_{max}

C: Equal to the maximum shear stress τ_{max}

D: Numerically equal to $(\sigma_1 - \sigma_3)/2$

Q :) A vane 20 cm long and 10 cm in diameter was pressed into soft marine clay at the bottom of a bore hole. Torque was applied gradually and failure occurred at 2000 kg/cm, the cohesion of the clay in kg/cm^2 is: [KPSC AE 2020]

A: $\frac{5}{\pi \times 7}$

B: $\frac{7}{\pi \times 6}$

C: $\frac{12}{\pi \times 7}$

D: $\frac{7}{\pi \times 12}$

Q :) Consider the following statements with regard to Soil Testing:

1. **The origin and pole are at the same point in a Mohr's circle**
2. **The shear stress is maximum on the failure plane**
3. **Mohr's circle drawn with data from an unconfined compression test passes through the origin**
4. **Maximum shear stress occurs on a plane inclined at 45^0 to the principal plane**

Which of the above statements are correct?

[ESE 2018]

A: 1 and 2 only

B: 2 and 3 only

C: 3 and 4 only

D: 1 and 4 only

Q :) Statement (I) : Cohesion and angle of internal friction are shear strength parameters of soils.
Statement (II): Cohesion is zero for pure sand and angle of internal friction is zero for pure clay.
[ESE 2017]
A: Both statements-I and statement-II are individually true and statement-II is the correct explanation of statement-I
B: Both statements-I and statement-II are individually true but statement-II is NOT the correct explanation of statement-I
C: Statement-I is true but statement-II is false
D: Statement-I is false but statement-II is true

Q :) The stability or shear strength of fine-grained soils can be increased by draining them with the passage of direct current through them. This process is known as
[ESE 2020]
A: Electro-osmosis
B: Zeta potential
C: Electro-chemical hardening
D: Consolidation

Q :) If the cohesion of a pure clay found in an unconfined compressive strength test is 1 kg/cm^2, then its unconfined compressive strength in kg/cm^2 is
[GPSC AE MARCH 2018]
A: 0.5
B: 2
C: 1
D: 4

Q :) If correct value of cohesion of highly soft clay is to be determines, choose the correct type of test that should be carried out…….
[GPSC Poly. Tch. Lect. 2016]
A: Field vane shear test
B: Triaxial shear test
C: Direct shear test
D: Laboratory unconfined compression test

Q :) Consistency as applied to cohesive soil is an indicator of its.
[UJVNL AE 2016]
A: Density
B: Shear strength
C: Moisture content
D: Porosity

Q :) If C is cohesion, σ is normal stress and ϕ is angle of internal friction of soil, then coulomb's equation of shear strength (S) can be represented as [GPSC AE JUNE 2019]

A: C = S + σ tan ϕ

B: S = σ + C tan ϕ

C: C = S - σ tan ϕ

D: S = C - σ tan ϕ

Q :) If drainage is permitted throughout, in a shear strength test during the application of both and shear stress, so that full consolidation occurs and no excess pore water pressures develop at any stage of the test, is known as

[GPSC ASSISTANT PROF. 2016]

A: Consolidated undrained test

B: Consolidated drained test

C: Unconsolidated undrained test

D: Unconfined compression test

Q :) A soil having, C = $\frac{\sqrt{3}}{2}$, $\phi = 30^0$ is subjected to cell pressure of 1 unit. The deviator stress at failure will be

[WBPSC AE 2003]

A: 3 unit

B: 4 unit

C: 5 unit

D: 6 unit

Q :) Which of the followings statements is/are correct?
[Chandigarh AE 2017]
A: Quick condition and liquefaction of saturated sands are based on similar phenomenon
B: Quick condition is with only earth dams
C: Liquefaction is possible in dry sand also
D: All of the above

Q :) Which one of the following statement provides the best argument that direct shear test are not suited for determining shear parameters of a clay soil?
[TNPSC AE 2018]
A: Failure plane is not the weakest plane
B: Pore pressures developed can not be measured
C: Satisfactory strain levels cannot be maintained
D: Adequate consolidation can not be ensured

Q :) While making the vertical excavation in soft saturated clay, soil caved in at a depth of 4 m. If the unit weight of soil is 20000 N/m^3, what is the cohesion of the soil?

[BHEL ET 2019]

A: 26.67 kN/m^2

B: 40 kN/m^2

C: 20 kN/m^2

D: 10 kN/m^2

Q :) The ratio of the horizontal effective stress σ_h, to the vertical effective stress, σ_v, is termed as :

[Karnataka PSC AE 2017 Paper-II]

A: Safe bearing capacity

B: Coefficient of lateral earth pressure

C: Friction

D: Optimum ratio

Q :) The poisson ratios of soil sample 1 & 2 are μ^2 respectively and the coefficient of earth pressure at rest for soil sample 1 and 2 are k_1 and k_2 respectively. If $\mu_1/\mu_2 = 1.5$ and $(1 - \mu_1)/(1 - \mu_2) = 0.875$, then k_1/k_2 will be

[ISRO Scientist/Engineer 2014]

A: 1.3125

B: 1.7143

C: 1.8213

D: 1.9687

Q :) Consider the following assumptions regarding coulomb's wedge theory:

1. **There is equilibrium of every element within the soil mass of the material**
2. **There is equilibrium of the whole of the material**
3. **Backfill is wet, cohesive, and ideally elastic**
4. **The wall surface is rough**

[ESE 2018]

Which of the above assumptions are correct?

A: 1 and 3 only

B: 1 and 4 only

C: 2 and 3 only

D: 2 and 4 only

Q :) The correct sequence of the given parameters in descending order of earth pressure intensity is [GPSC AE Class (1 & 2) Paper – 2 2017 UPRVUNL AE 2015/ ESE 2000]

A: Active, passive, at rest

B: Passive, active, at rest

C: Passive, at rest, active

D: At rest, passive, active

Q :) A phreatic line is defined as the line within a dam section below which there are
[OPSC AE Paper-II 2019]
A: Positive equipotential lines
B: Atmospheric pressure
C: Positive hydrostatic pressure
D: Negative hydrostatic pressure

Q :) A vertical retaining wall retains a C-ϕ backfill with a surcharge of uniform intensity q per unit area. The depth Z_0 where the active earth pressure is zero is given by

[RPSC AE (GWD) 2014]

A: q/ ϒ

B: $\frac{2C'}{\gamma}$ tan α' – q/ ϒ

C: $\frac{2C'}{\gamma}$ tan α' + q/ ϒ

D: $\frac{2C'}{\gamma}$ tan α'