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

A : q/y

B : 2c'/ϒ tan α'- q/y

C : 2c'/ϒ tan α'+ q/y

D : 2c'/ϒ tan α'

Q :) The wall friction of the retaining wall

A : Decrease active earth pressure passive earth pressure but increase

B : Decrease passive earth pressure but increase active earth pressure

C : Decreases both active and passive earth pressure

D : Increases both active and passive earth pressure

Q :) An unsupported vertical cut may be made in cohesive soil to a height of:

(a) $\frac{2C}{\gamma}\tan\left(45^0+\frac{\phi}{2}\right)$

(b) $\frac{2q_u}{\gamma}\tan\left(45^0+\frac{\phi}{2}\right)$

(c) $\frac{4q_u}{\gamma}\tan\left(45^0-\frac{\phi}{2}\right)$

(d) $\frac{4C}{\gamma}\tan\left(45^0+\frac{\phi}{2}\right)$

Q :) To have zero active earth pressure intensity at the top of a wall in cohesive soil, the required intensity of uniform surcharge is :

A : $2C \cot \alpha$

B : $2C \tan \alpha$

C : $-2C \cot \alpha$

D : $-2C \tan \alpha$

Q :) If Δp is increment of pressure on a normally consolidated saturated soil mass, as per Terzahghi's theory at the instant of application of pressure increment i.e., When time t = 0, what is = the pore pressure developed in the soil mass?

A : Zero

B : Very much less than Δp

C : Equal to Δp

D : Greater than Δp

Q :) An all-around RCC peripheral retaining wall is other side. The retaining wall has RCC floor slab retaining wall will be analyzed in

A : Passive condition

B : Active condition

C : At rest condition

D : Partially active and partially passive condition

Q :) The earth pressure behind a bridge abutment is-

A : Active

B : Passive

C : At rest

D : Constant always and everywhere

Q :) A wall constructed for the stability of the excavated portion of the road on the hill side is known as

A : Parapet wall

B : Petaining wall

C : Breast wall

D : Guide wall

Q :) Which of the following assumptions of the Rankine theory of lateral earth pressure are correct?

1. The soil mass is semi-infinite, homogeneous, dry and cohesion-less
2. The ground surface is a plane which may be horizontal or inclined
3. The wall yields about the base and thus satisfies the deformation condition for plastic equilibrium

A : 1 and 2 only B : 1 and 3 only

C : 1, 2 and 3 D : 2 and 3 only

Q :) Saturated unit weight of a soil is 20 kN/m and unit weight of water is 10 kN/m'. If the ground water table is at the surface of soil lateral earth pressure coefficient of soil is 0.4, effective lateral stress at 10 m depth will be-

A : -20 kPa

B : 40 kPa

C : 80 kPa

D : 180 kPa

Q :) In a cohesion less soil deposit with a unit weight of 15 kN/m² and an angle of internal friction of 30°, the active and passive earth pressures (in kN/m²) at a depth of 10 m will be, respectively:

A : 150 and 50

B : 100 and 200

C : 50 and 450

D : 200 and 100

Q :) According to Coulomb's wedge theory, the active earth pressure slides the wedge:

A : Up and inwards on a slip surface

B : Down and outwards on a slip surface

C : Horizontal upward and parallel to base

D : Horizontal inward and parallel to base

E : None of these options

Q :) The coefficient of earth pressure is defined as the ratio of

A : Effective stress to neutral stress

B : Total stress to effective stress

C : Vertical stress to horizontal stress

D : Horizontal stress to vertical stress

Q :) Rankine's earth pressure theory is least violated in

A : cantilever retaining wall

B : gravity retaining wall

C : sheet pile coffer dam

D : anchored bulk head

Q :) What of the following statements is incorrect?

A : Even the slight movement of wall away from backfill develops full active earth pressure.

B : Earth pressure at rest will be present when the wall does not move relative to the back fill.

C : Full passive earth pressure develops only after considerable movement of wall towards the backfill.

D : For a given wall and backfill conditions, the magnitude of active earth pressure will always be higher than passive earth pressure.

Q :) Sheet piles are used primarily for

A : to carry vertical load from structure

B : to prevent seepage of water

C : retaining side of cuts

D : to increase bearing capacity of soil

Q :) For foundation on clayey soil, the maximum differential settlement is limited

A : 20 mm

B : 30 mm

C : 40 mm

D : 50 mm

Q :) A wooden pile is being driven with a drop hammer weighing 20 kN and having a free fall of 1.0m. The penetration in the last blow is 5 mm. The load carrying capacity of the pile as per engineering news Formula is :

A : 33.33 kN

B : 66.66 kN

C : 222.2 kN

D : 111.1 kN

Q :) Net ultimate bearing capacity of a soil is 25 t/m² and density 1.7 t/m°. The safe bearing capacity at 1 m below the ground surface taking a factor of safety 2.5 will be

A : 10 t/m

B : 25 t/m

C : 11.7 t/m

D : 62.5 t/m

Q :) For local shear failure (if o = angle of internal friction)

A : $\phi > 28°$

B : $\phi > 36°$

C : $\phi < 28°$

D : $\phi < 36°$

Q :) The net ultimate bearing capacity of a purely cohesive soil

A : depends on the width of the footing and is independent of the depth of the footing

B : depends on the width as well as the depth of the footing

C : depends on the depth but is independent of the width of the footing

D : is independent of both the width and depth of the footing

Q :) The minimum gross pressure intensity at the base of the foundation at which the soil fails in shear is called as :

A : Ultimate bearing capacity

B : Net safe bearing capacity

C : Allowable bearing capacity

D : Safe bearing capacity

Q :) In Terzaghi's bearing capacity analysis, the soil wedge immediately below the footing remains in state of –

A : Plastic equilibrium

B : Radial shear

C : Elastic equilibrium

D : Linear shear

Q :) The weight of the hammer used in the standard penetration test is :

A : 50 kg

B : 60 kg

C : 65 kg

D : 75 kg

Q :) In a plate load test on a sandy soil, the test plate of 60 cm x 60 cm undergoes a settlement of 5 mm at a pressure of 12 x 10^4 N/m^2. What will be the expected settlement of 3m x 3m footing under the same pressure?

A : 9 mm

B : 15 mm

C : 20 mm

D : 25 mm

Q :) Which of the following exhibits maximum deformation?

A : Local shear failure

B : General shear failure

C : Punching shear failure

D : Composite failure

Q :) Due to large leakage and flood damage problems, following type of coffer dam is not preferred

A : Braced type

B : Cantilever sheet pile type

C : Cellular type

D : Double wall type

Q :) For determining the ultimate bearing capacity of soil, the recommended size of a square bearing plate to be used in plate load test should be 30 to 75 cm square with a minimum thickness of

A : 10 mm

B : 16 mm

C : 25 mm

D : 32 mm

Q :) Contact pressure for a rigid footing resting on clay at the edge and the centre are____ and____ respectively.

A : Zero; maximum

B : Minimum; maximum

C : Maximum; minimum

D : Maximum; zero