



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad - 500 043

CIVIL ENGINEERING

DEFINITIONS AND TERMINOLOGY QUESTION BANK

Course Name	:	FOUNDATION ENGINEERING
Course Code	:	ACE018
Program	:	B.Tech
Semester	:	VIII
Branch	:	Civil Engineering
Section	:	A&B
Academic Year	:	2019– 2020
Course Faculty	:	Mr. N.Venkat Rao, Associate Professor Ms.U.Deepthi , Assistant Professor Ms. V.Aivelu manga, Assistant professor

COURSE OBJECTIVES:

The course should enable the students to:	
I	Understand various methods of soil exploration and field tests on soil, planning and preparation of soil investigation programme.
II	Analyze the stability of infinite and finite slopes
III	Calculate At rest, Active and Passive earth pressures of soil & Analyze the stability of retaining wall against sliding, overturning and bearing capacity failures.
IV	Calculate the bearing capacity of shallow and deep foundation from theoretical & field tests.

DEFINITIONS AND TERMINOLOGY QUESTION BANK

S.NO	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
UNIT-I						
1	What is soil exploration?	Soil exploration refers to the study of obtaining soil samples for the investigation of its Engineering properties, location of water table and profiles earth strata.	Understand	CO 1	CLO 1	ACE018.01
2	What is the purpose of soil exploration?	The main aim of preliminary exploratory is to get an approximate idea of the sub soil at low cost, Few numbers of bore holes, test pits and penetration tests are carried out for general exploration. Disturbed samples are tested in the laboratory to determine the physical properties of soil.	Remember	CO 1	CLO 1	ACE018.01

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3	What are the IS guidelines for choosing spacing and depth of boring?	The minimum depth of core boring into the bedrock is about 3m. If the bedrock is irregular or weathered, the core borings may have to be extended to greater depths	Understand	CO 1	CLO 1	ACE018.01
4	What are the stages of site investigation?	A basic three stage site investigation scheme is put forward 1.Preliminary exploration 2 Detailed explorations 3. Foundation investigation	Remember	CO 1	CLO 1	ACE018.01
4	What is soil investigation report?	Soil Investigation Report or Soil reports, also called “geotechnical soils reports” are prepared by a licensed geotechnical engineer or a registered civil engineer experienced in soils engineering. They are required in areas with expansive or low strength soils.	Understand	CO 1	CLO 2	ACE018.02
5	Why is soil investigation necessary?	Soil management and climate changes, can also affect soil properties. The construction process bears such a great importance because it can cause foundation failures due to the insufficient bearing capacity of the soil.	Remember	CO 1	CLO 2	ACE018.02
6	What is meant by disturbed sample?	A soil sample is the representative of the whole lot from which it is taken. It completely represents all the characteristics of the lot from which it is recovered	Understand	CO 1	CLO 2	ACE018.02
7	What is the meaning of soil investigation?	Geotechnical investigations are performed by geotechnical engineers or engineering geologists to obtain information on the physical properties of soil earthworks and foundations for proposed structures and for repair of distress to earthworks and structures caused by subsurface conditions.	Remember	CO 1	CLO 2	ACE018.02
8	What are the geophysical methods of exploration?	Exploration geophysics is an applied branch of geophysics, which uses physical methods, such as seismic, gravitational, magnetic, electrical and electromagnetic at the surface of the Earth to measure the physical properties of the subsurface, along with the anomalies in those properties.	Understand	CO 1	CLO 3	ACE018.03

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9	What is a subsoil investigation?	Sometimes it is also known as geotechnical investigation. It provides data on surface and underground conditions at the proposed site. Ground or soil investigation by means of boring, sampling, testing, and etc.	Remember	CO 1	CLO 3	ACE018.03
10	What is depth of exploration?	Soil explorations are made in each bed below the foundation to a depth of at least 1 - 1/2 times the breadth of the foundations.	Understand	CO1	CLO 3	ACE018.03
12	Why geotechnical investigation is important?	The purpose of geotechnical investigations is to design earthworks, pilings and foundations for structures, and to execute earthwork repairs necessitated due to changes in the subsurface environment.	Remember	CO 1	CLO 3	ACE018.03
13	What is significant depth?	The depth at which soil does not contribute settlement of foundation.	Understand	CO 1	CLO 4	ACE018.04
14	What is N value in soil report?	The depth at which soil does not contribute settlement of foundation.	Remember	CO 1	CLO 4	ACE018.04
15	What is soil boring test?	A Soil Boring Test is a type of geologic engineering tests to determine the capability of the soil or to determine the strength and properties of a required building foundation.	Understand	CO 1	CLO 4	ACE018.04
16	What is Refusal?	The condition reached when a pile or a soil sampler being driven by a hammer has negligible penetration from each blow of the hammer Occurs when very hard soil or rock is encountered. Also applies to cone penetration tests when the cone cannot advance further.	Understand	CO 1	CLO 4	ACE018.04
17	What is Shelby tube Sampler	The device used for obtaining soil samples, usually undisturbed and from some depth beneath the surface. The Shelby-tube sampler is a tube that is pressed into the soil to be sampled, usually by a drilling rig. The sample is removed from within the Shell by tube by pushing or extruding it from the tube.	Remember	CO 1	CLO 4	ACE018.04
18	What is Split Spoon Sampler	The device used for obtaining soil samples in a predrilled hole and from some depth beneath the surface. The split-spoon sampler is a tube that is driven into the soil to be sampled. The sampler is opened by splitting it longitudinally to retrieve the soil sample from within. Part of the Standard Penetration Test (SPT).	Remember	CO 1	CLO 4	ACE018.04

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19	What are various geophysical methods for soil exploration?	Seismic Refraction method, Electrical Resistivity Method is most commonly used test for soil exploration.	Understand	CO 1	CLO 3	ACE018.03
20	What is CPT	CPT refers to Cone Penetration Test. The Cone penetration test can be carried out from the ground surface with a need for a borehole. The test is carried out by first pushing the cone into the ground at a standard velocity of 1 to 2 cm/s while keeping the sleeve stationary. For any depth, the resistance of the cone, called cone penetration resistance q_c	Remember	CO 1	CLO 3	ACE018.03
21	What is DCPT	DCPT refers to Dynamic Cone Penetration test. It is similar to SPT expect that for DCPT a cone is provide at the bottom.	Remember	CO 1	CLO 3	ACE018.03
22	What is Sub Soil Exploration	The process of collection soil data for the assessment soil properties at a site through series of laboratory and field investigation is collectively called Sub-soil Exploration.	Remember	CO 1	CLO 1	ACE018.01
23	What are semi direct methods of soil Exploration	Auger Boring, Wash boring, percussion drilling and rotary drilling are various semi direct methods of soil exploration	Remember	CO1	CLO 3	ACE018.03
24	What is spacing between boreholes for soil exploration	For Soft Soils spacing of bore holes is 30 to 60 m , For hard soils become spacing may be increased up to 150 m	Remember	CO 1	CLO 4	ACE018.04
25	What is Dilatancy correction & Overburden Correction for SPT N Value	Dilatancy Correction $N' = 15 + 0.5*(N-15)$ Overburden Correction $N'' = 0.77 \log(2000/\sigma_o)'*N$	Understand	CO 1	CLO 3	ACE018.03
UNIT – II						
1	In what ways does water affect slope stability?	The water affects slope stability in terms of fluid pressure.	Remember	CO 2	CLO 5	ACE018.05

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2	What causes slope instability?	Common causes of slope failure include Slope Steepness Steeper slopes have greater risks for instability. Explanation: When water takes the place of air between the grains of soil, it will most likely increase the probability of downslope mass movement and lead to slope failures as the earth in slopes become a lot heavier.	Understand	CO 2	CLO 5	ACE018.05
3	What are the main factors that influence slope stability?	Five factors influence slope stability of an embankment Shear strength of the soil Unit weight Embankment weight Slope steepness and Pore pressure within the soil.	Remember	CO 2	CLO 5	ACE018.05
4	How do you stabilize slopes?	There are many methods that could be used to help prevent or stop erosion on steep slopes, some of which are listed below. Build Terraces. Create diversions to help drainage.	Understand	CO 2	CLO 5	ACE018.05
5	What is slip failure?	In a bank of homogeneous earth or clay, the slip surface of failure closely follows the arc of a circle that usually intersects the toe of the bank.	Remember	CO 2	CLO 6	ACE018.06
6	What is finite slope?	The term infinite slope is used to designate a constant slope of infinite extent. The long slope of the face of a mountain	Understand	CO 2	CLO 6	ACE018.06
7	What is stability Number?	It is the method used to evaluate slope stability for homogeneous soils having cohesion	Remember	CO 2	CLO 6	ACE018.06
8	What is the principle of stability Number?	This method is proposed by the Taylor. It is based on the principle resistance of soil mass against sliding, because of cohesion and internal friction acting over the failure plane	Understand	CO 2	CLO 6	ACE018.06
9	What is mobilized cohesion?	Mobilized cohesion is the portion of the maximum cohesion developed along the slip plane or failure plane	Remember	CO 2	CLO 7	ACE018.07
10	What is angle of shearing resistance?	Shear strength is a term used in soil mechanics to describe the magnitude of The shear stress that a soil can sustain. The shear resistance of soil is a result of friction and interlocking of particles, and possibly cementation or bonding at particle contacts.	Understand	CO 2	CLO 7	ACE018.07
11	What is friction angle of soil?	Soil friction angle is a shear strength parameter of soils. Its definition is derived from the Mohr-Coulomb failure criterion and it is used to describe the friction shear resistance of soils together with the normal effective stress	Remember	CO 2	CLO 7	ACE018.07

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12	What is drained soil?	Drained condition occurs when there is no change in pore water pressure due to external loading	Understand	CO 2	CLO 7	ACE018.07
13	What can be done to slow erosion on steep slopes?	There are many methods that could be used to help prevent or stop erosion on steep slopes, some of which are listed below. Plant Grass and Shrubs. Grass and shrubs are very effective at stopping soil erosion. Use Erosion Control Blankets to add Vegetation to Slopes.	Remember	CO 2	CLO 8	ACE018.08
14	What are the causes of slope erosion?	Four factors cause slope erosion are Amount and rate of rainfall, steepness or gradient of the slope, Amount and nature of plant cover, Type of soil and bedrock underneath.	Understand	CO 2	CLO 8	ACE018.08
15	What is Undrained soil?	Undrained condition occurs when the pore water is unable to drain out of the soil.	Remember	CO 2	CLO 8	ACE018.08
16	What is slope stability	Slope stability is the process of calculating and assessing how much stress a particular slope can manage before failing.	Remember	CO 2	CLO 5	ACE018.05
17	Define natural slope	Slopes which are formed naturally and which exists in hilly areas are natural slopes	Remember	CO 2	CLO 5	ACE018.05
18	Define Man Made slopes	The sides of cuttings. The slopes of embankments constructed for roads railway lines, canals etc. The slopes of earth dams constructed for storing water are few man made slopes.	Remember	CO 2	CLO 5	ACE018.05
19	What is Infinite Slope	The term infinite slope is used to designate a constant slope of infinite extent. The long slope of the face of a mountain	Understand	CO 2	CLO 5	ACE018.05
20	What is Factor of Safety	It is the ratio of Resisting forces by Driving forces	Understand	CO 2	CLO 6	ACE018.06
21	What is Taylor stability Number?	Taylor stability number is denoted by N_s F_c = Factor of Safety with respect to cohesion, γ = unit weight of soil H = Height of embankment C' = Unit Cohesion	Remember	CO 2	CLO 6	ACE018.06
22	What are various methods of slope stability analysis for finite slopes	The most commonly used slope stability analysis are Bishop simplified, friction circle, Morgenstern and Spencer's method	Understand	CO 2	CLO 6	ACE018.06
23	What is mobilized cohesion?	Mobilized cohesion is the portion of the maximum cohesion developed along the slip plane or failure plane	Understand	CO 2	CLO 7	ACE018.07

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24	What is angle of shearing resistance?	Shear strength is a term used in soil mechanics to describe the magnitude of the shear stress that a soil can sustain. The shear resistance of soil is a result of friction and Inter locking of particles, and possibly cementation or bonding at particle contacts.	Understand	CO 2	CLO 7	ACE018.07
25	What is angle of friction of soil?	Angle of internal friction is a measure of the ability of a unit of rock or soil to withstand a shear stress. It is the angle (ϕ), measured between the normal force (N) and resultant force (R), that is attained when failure just occurs.	Remember	CO 2	CLO 7	ACE018.07
26	What is shear strength?	Shear strength of a soil is equal to the maximum value of shear stress that can be mobilized within a soil mass without failure taking place	Understand	CO 2	CLO 7	ACE018.07
27	What are factors Effecting slope stability	Slope stability is affected by the following factors. They are Strength of soil and rock. Type of soil and stratification. Discontinuities and planes of weakness. Groundwater table and seepage through the slope. External loading. Geometry of the slope.	Remember	CO 2	CLO 5	ACE018.05
28	What are causes of slope failure	The different causes of slope failure are Erosion, Rainfall, Earthquakes, Geological factors, External loading, Construction activities such as excavation of slopes and filling of slopes, Rapid drawdown, Increment of pore water pressure, The change in topography.	Understand	CO 2	CLO 6	ACE018.06
UNIT – III						
1	What is Coulomb earth pressure theory?	Coulomb theory first studied the problem of lateral earth pressures on retaining structures. He used limit equilibrium theory, which considers the failing soil block as a free body in order to determine the limiting horizontal earth pressure.	Understand	CO 3	CLO 9	ACE018.09
2	What is active earth pressure?	Active earth pressure is the one that is exerted by the soil that tends to overturn or slide the retaining wall	Understand	CO 3	CLO 9	ACE018.09
3	What is earth pressure at rest?	Pressure acts on the earth when it is in equilibrium conditions. The earth pressure at rest is 0.	Remember	CO 3	CLO 9	ACE018.09
4	Why is a retaining wall designed for active pressure?	As wall is designed for active pressure it will move slightly away from soil due to pressure at rest but it will be stable for active thrust given by soil. So retaining walls are always designed for active pressure.	Understand	CO 3	CLO 9	ACE018.09

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5	What is the difference between Rankine and Coulomb?	The interface between the soil and the retaining wall is not assumed frictionless (as it is in Rankine theory)	Remember	CO 3	CLO10	ACE018.10
6	Where are retaining walls used?	Retaining walls are stabilizing structures that are used for holding back earth.	Understand	CO 3	CLO 10	ACE018.10
7	What are the different types of earth pressure?	These three basic types of lateral earth pressures are discussed below: Active Earth Pressure Passive Earth Pressure Earth Pressure at Rest	Understand	CO 3	CLO 10	ACE018.10
8	What is active earth pressure coefficient?	The minimum stable value of K is called the active earth pressure coefficient, K_a	Remember	CO 3	CLO 10	ACE018.10
9	What is Coulomb wedge theory?	The Coulomb theory provides a method of analysis that gives the resultant horizontal force on a retaining system for any slope of wall, wall friction, and slope of backfill provided. This theory is based on the assumption that soil shear resistance develops along the wall and failure plane.	Understand	CO 3	CLO11	ACE018.11
10	What is effective stress of soil?	Effective stress is a force that keeps a collection of particles rigid. Usually this applies to sand, soil, or gravel	Remember	CO 3	CLO 11	ACE018.11
12	What is lateral bearing pressure?	Lateral earth pressure can be defined as the pressure exerted by the soil against a retaining structure on a surface of a surrounding soil mass.	Understand	CO 3	CLO 11	ACE018.11
13	What is allowable bearing pressure?	It is the maximum possible loading that can be applied over a unit area, which the soil will be able to resist without undergoing any excessive settlement and shear failure. It is otherwise termed as design bearing capacity.	Remember	CO 3	CLO 11	ACE018.11
14	What is Ultimate bearing capacity soil bearing pressure?	Ultimate bearing capacity is the theoretical maximum pressure which can be supported without failure	Understand	CO 3	CLO12	ACE018.12
15	Which soil has least bearing capacity?	The least bearing capacity of soil is that of Hard rock, Moist clay, Soft rock and Coarse sandy soil.	Remember	CO 3	CLO 12	ACE018.12
16	What are the factors affecting bearing capacity?	Soil properties like shear strength, density, permeability etc., affect the bearing capacity of soil. Dense sand will have more bearing capacity than loose sand as unit weight of dense sand is more than loose sand.	Remember	CO 3	CLO 12	ACE018.12

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17	Define Retaining Wall	A retaining wall is a wall that provides lateral support for a vertical or nearly vertical slope of soil.	Remember	CO 3	CLO 12	ACE018.12
18	What are various types of retaining walls	The most commonly available retaining walls are Gravity retaining wall, Cantilever retaining wall and counter-fort retaining wall	Remember	CO 3	CLO 12	ACE018.12
19	What is Gravity retaining wall	These are constructed with plain concrete or stone masonry. These walls depend on self-weight and any soil resting on the masonry for their stability	Understand	CO 3	CLO12	ACE018.12
20	What is at rest earth pressure	The ratio of horizontal stress (σ_h) to vertical stress (σ_v) for a homogenous backfill material when the wall does not move at all is termed as at rest earth pressure K_0 .	Understand	CO 3	CLO 9	ACE018.09
21	What is active earth pressure	Active earth pressure is the earth pressure when the wall moves away from soil.	Understand	CO 3	CLO 9	ACE018.9
22	What is passive earth pressure	Passive earth pressure is the earth pressure when the wall moves into the soil	Understand	CO 3	CLO 9	ACE018.9
23	What is Rankine's passive earth pressure coefficient?	For the case of dry cohesion less horizontal backfill material passive earth pressure	Understand	CO 3	CLO10	ACE018.10
24	What is Rankine's active earth pressure coefficient?	For the case of dry cohesion less horizontal backfill material active earth pressure coefficient as per Rankine is given by formula	Remember	CO 3	CLO10	ACE018.10
25	What is Mohr coulomb failure envelope	The Mohr coulomb failure envelope is given by major principal stress σ_3 = minor principal stress c' = effective cohesion Φ' = effective angle of internal friction	Remember	CO 3	CLO11	ACE018.11
26	What is lateral earth pressure	Lateral earth pressure is the pressure that soil exerts in the horizontal direction	Remember	CO 3	CLO 9	ACE018.09
27	Where do we use earth pressure theories	Calculating lateral earth pressure is necessary in order to design Retaining wall, bridge abutments, Temporary earth supporting systems.	Understand	CO 3	CLO10	ACE018.10
28	What is difference between Rankine's and coulomb earth pressure theory	Rankine's theory does not consider friction between wall and soil whereas coulomb theory consider the friction between wall and soil	Understand	CO 3	CLO10	ACE018.10

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29	What is the design Factor of Safety against Sliding for retaining wall	The retaining wall should be design in such a way that factor of safety against sliding, F_s should be greater than or equal to 1.5. Factor of safety against sliding,	Remember	CO 3	CLO13	ACE018.13
30	What is the factor of safety against overturning	Factor of safety against overturning, F_o is given by the equation.	Understand	CO 3	CLO13	ACE018.13
UNIT – IV						
1	What are shallow and deep foundations?	Foundation which is placed near the surface of the earth or transfers the loads at shallow depth is called shallow Foundation. Foundation which is placed at a greater depth or transfers the loads to deep strata is called deep foundation.	Understand	CO 4	CLO13	ACE018.13
2	How deep are building foundations?	In more difficult ground conditions, deeper foundations may be required. However, at a depth of around 2.5 m	Remember	CO 4	CLO13	ACE018.13
3	What are the different types of foundations used in construction?	Following are different types of foundations used in construction: Shallow foundation. Individual footing or isolated footing. Combined footing.Stripfoundation.Raftformatfoundation.DeepFoundationPilefoundation. DrilledShaftsor caissons.	Understand	CO 4	CLO13	ACE018.13
4	What are the two types of foundations?	Types of foundation are Shallow foundations sometimes called spread footings, strip footings and rafts. Deep foundations include piles, pile walls, diaphragm walls and caissons.	Remember	CO 4	CLO13	ACE018.13
5	What is shallow foundation?	A shallow foundation is a type of building foundation that transfers building loads to the earth very near to the surface, rather than to a subsurface layer or a range of depths as does a deep foundation.	Understand	CO 4	CLO14	ACE018.14
6	What are deep foundation and its types?	A deep foundation is a type of foundation that transfers building loads to the earth farther down from the surface than a shallow foundation does to a subsurface layer or a range of depths.	Remember	CO 4	CLO14	ACE018.14

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7	What are footings and foundations?	Footings are an important part of foundation construction. They are typically made of concrete with rebar reinforcement that has been poured into an excavated trench. The purpose of footings is to support the foundation and prevent settling. Footings are especially important in areas with troublesome soils.	Understand	CO 4	CLO14	ACE018.14
8	What is pile cap construction?	A pile cap is a thick concrete mat that rests on concrete or timber piles that have been driven into soft or unstable ground to provide a suitable stable foundation	Remember	CO 4	CLO14	ACE018.14
9	What is pile group efficiency?	Capacity of pile group is the sum of the individual capacities of piles, but it is influenced by the spacing between the piles	Understand	CO 4	CLO15	ACE018.15
10	What is pile capacity?	The ultimate bearing capacity of a pile is the maximum load which it can carry without failure or excessive settlement of the ground	Remember	CO 4	CLO15	ACE018.15
11	What is negative skin friction?	Negative skin friction occurs when concrete piles are situated in soft soils, consolidating soil-mass	Understand	CO 4	CLO15	ACE018.15
12	What type of footing is a continuous footing?	Strip footing is also known as continuous footing.	Remember	CO 4	CLO15	ACE018.15
13	What is the minimum depth of foundation?	The minimum depth of footing in sloping ground with the rock, the horizontal distance shall be at least 600 mm or 2 feet from the lower edge of the footing.	Understand	CO 4	CLO16	ACE018.16
14	What is friction pile?	When a pile is driven into soil of fairly uniform consistency and the tip is not seated in a hard layer, the load-carrying capacity of the pile is developed by skin friction.	Understand	CO 4	CLO16	ACE018.16
15	Why pile foundations are required?	Pile foundations are required when there is a layer of weak soil at the surface. This layer cannot support the weight of the building, so the loads of the building have to bypass this layer and be transferred to the layer of stronger soil or rock that is below the weak layer.	Remember	CO 4	CLO16	ACE018.16
16	What is bearing capacity?	Bearing capacity is the capacity of soil to support the loads applied to the ground.	Remember	CO 4	CLO14	ACE018.14
17	What is ultimate bearing capacity?	The load per unit area of the foundation at which shear failure in soil occurs is called ultimate bearing capacity	Remember	CO 4	CLO14	ACE018.14

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18	What is General shear failure	A sudden failure in the soil supporting the foundation takes place, and the failure surface extend to ground surface such failure is referred as general shear failure	Understand	CO 4	CLO15	ACE018.15
19	What is Allowable bearing capacity	Allowable bearing capacity is the ultimate bearing capacity divided by factor of safety	Remember	CO 4	CLO14	ACE018.14
20	What is net safe bearing capacity?	Net safe bearing capacity is given is denoted by q_{ns} $q_{ns} = (q_u - \gamma D_f) / FOS$ where, q_u = ultimate bearing capacity of soil γ = unit weight of soil D_f = depth of foundation FOS = factor of safety	Remember	CO 4	CLO14	ACE018.14
21	Write Terzaghi ultimate bearing capacity equation for continuous footing	Ultimate bearing capacity as per Terzaghi is given by $q_u = C' N_c + q N_q + 0.5 \gamma B N_\gamma$ Where C' = Cohesion of soil N_c, N_q, N_γ = bearing capacity factors $q = \gamma D_f$ γ = unit weight of soil D_f = depth of foundation B = width of foundation	Remember	CO 4	CLO16	ACE018.16
22	What is settlement of footing as per plate load test	The settlement of footing as per plate load test is given by the equation $S_f = S_p$ Where S_p = settlement of plate b_p = width of plate B = width of footing	Remember	CO 4	CLO17	ACE018.17
23	What is plate load test	It is in-situ used to estimate the allowable bearing pressure of soil to induce to induce a given amount of settlement.	Understand	CO 4	CLO18	ACE018.18
25	What is combined footing	A combined footing is a long footing supporting two or more columns in one row.	Understand	CO 4	CLO15	ACE018.15
26	What is end bearing pile	These piles transfer their load onto a firm stratum located at a considerable depth below the base of the structure, and they derive most of their carrying capacity from the penetration resistance of the soil at the toe of the pile.	Understand	CO 4	CLO18	ACE018.18
27	What is the ultimate load capacity of pile	The ultimate load carrying capacity of a pile is given by $Q_u = q_b A_b + f_s A_s$ Where q_b = ultimate unit bearing capacity of the pile at the base A_b = bearing Area of the base of the pile f_s = unit Skin friction A_s = total surface area of pile below the ground surface	Remember	CO 4	CLO20	ACE018.20

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UNIT – IV						
1	What are the materials required for	Materials generally used for construction are reinforced concrete, brick or stone masonry well Foundation?	Understand	CO 5	CLO17	ACE018.17
2	Why scour level is provided in well Foundation?	The well need to embedded or sunk below the maximum scour level to a required depth in order that the resistance from the sides of well is able to withstand the lateral forces acting on the well.	Remember	CO 5	CLO17	ACE018.17
3	What is Steining in well Foundation?	It is the wedge shaped RCC ring beam located at the lower portion of the well Steining provided to facilitate sinking.	Understand	CO 5	CLO17	ACE018.17
4	What is well curb?	A protective structure around the top rims of a well to prevent objects from falling into it	Remember	CO 5	CLO17	ACE018.17
5	How we can prevent sinking of well Foundation?	Sinking of well Foundation can be prevented by the formation of hump inside the dredge hole or wells cracking due to sand blow, or in a stiff clay layer wells becoming stationary and not sinking down are quite common situations	Understand	CO 5	CLO18	ACE018.18
6	What is well Foundation?	Well foundation is a type of deep foundation which is generally provided below the water level for bridges.	Remember	CO 5	CLO18	ACE018.18
7	What are the elements of well Foundation?	Basic Elements of A Well Foundation Well-cap, Steining, Well curb, Bottom plug, Top plug and Intermediate plug.	Understand	CO 5	CLO18	ACE018.18
8	What is the shape of well?	Round Wells, rectangular or square wells.	Remember	CO 5	CLO18	ACE018.18
9	What is a caisson in construction?	In geotechnical engineering a caisson is a watertight retaining structure used, for example, to work on the foundations of a bridge pier for the construction of a concrete dam, or for the repair of ships	Understand	CO 5	CLO19	ACE018.19
10	What is caisson foundation?	A caisson foundation also called as pier foundation is a watertight retaining structure used as a bridge	Remember	CO 5	CLO19	ACE018.19

S.NO	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
11	Why do we use deep foundations?	Deep foundation means a foundation unit that provides support for a building by transferring loads either by end-bearing to a soil or rock at considerable depth below the building or by adhesion or friction, or both, in the soil or rock in which it is placed.	Understand	CO 5	CLO19	ACE018.19
12	What is a pile foundation?	A pile is basically a long cylinder of a strong material such as concrete that is pushed into the ground to act as a steady support for structures built on top of it.	Remember	CO 5	CLO19	ACE018.19
13	What is tilt and shift of well?	In general, tilt occurs during or after sinking, while the tilt is rectified partly or fully, shift occurs automatically.	Understand	CO 5	CLO20	ACE018.20
14	What is the difference between a caisson and a pile?	A caisson foundation also called as pier foundation is a watertight retaining structure used as a bridge pier, in the construction of a concrete dam, or for the repair of ships	Remember	CO 5	CLO20	ACE018.20
15	What is meant by floating foundation?	Floating foundation is a building support on soft soil that consists of a stiff reinforced concrete slab which distributes the concentrated loads by columns to the soil so that the pressure intensity on the soil is nowhere more than the acceptable amount.	Understand	CO 5	CLO20	ACE018.20
16	What is combined pile?	These piles transfer the load by the combination of end bearing at the bottom of pile and friction along the surface of the pile.	Understand	CO 5	CLO19	ACE018.19
17	What is Sheet Pile	These piles are used to retain the earth or water.	Understand	CO 5	CLO19	ACE018.19
18	What is compaction Pile	These piles are driven into the ground to compact the loose granular soil to increase the relative density	Understand	CO 5	CLO19	ACE018.19
19	What is Tension Piles	These piles are used to anchor down the structure subjected to hydraulic uplift forces or overturning forces	Understand	CO 5	CLO19	ACE018.19
20	What is open caisson	The top & bottom of the caisson is open during construction in this type of caisson	Remember	CO 5	CLO21	ACE018.21

S.NO	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
21	What is Pneumatic caisson	A pneumatic caisson has a working chamber at the bottom of the caisson which is kept dry by forcing out water under pressure, thus permitting excavation under dry conditions	Remember	CO 5	CLO21	ACE018.21
22	What are the forces acting on well foundation	The well foundation is subjected to dead loads and live loads. In addition, it is subjected to forces such as wind, force due to water currents, Buoyancy, earth pressure, temperature, Seismic and force due to tractive effort of vehicles.	Understand	CO 5	CLO22	ACE018.22
23	Write the equation for allowable bearing pressure for well in cohesion less soil	Allowable bearing pressure for a well in a cohesion less soil as per IS 3955 (1967) is given by $Q_a = 5.4N^2B + 16(100 + N^2)D$ where Q_a = allowable bearing pressure in, kg/m^2 N = Corrected value of standard penetration resistance B = smaller dimension of well section, in m D = Depth of foundation below scour level	Remember	CO 5	CLO22	ACE018.22
24	What is expansive soil	Expansive soils experience significant volume change associated with changes in water contents. These volume changes can either be in the form of swell or shrinkage.	Understand	CO 5	CLO20	ACE018.20
25	What is well cap	The well cap is a RCC slab laid at the top of the well steining and is usually cast monolithically with the steining. It transmits the load of the super structure to the steining.	Understand	CO 5	CLO21	ACE018.21
26	What is Cutting Edge	The lowermost portion of the well curb is the cutting edge. It cuts into the soil during sinking	Remember	CO 5	CLO21	ACE018.21
27	What is bottom plug	After the well is sunk to the required depth, the base of the well is plugged with concrete. This is called bottom plug, it transmits the load to subsoil.	Understand	CO 5	CLO21	ACE018.21

S.NO	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
28	What is Dredge hole	The well is sunk by excavating soil from within the well. The hole formed due to excavation of soil is dredge hole. The dredge hole is later filled with sand, which helps in distributing the load of the super structure to the bottom plug.	Understand	CO 5	CLO21	ACE018.21
29	What is top plug	A concrete plug covering the sand filling is usually constructed at the top. It is called top plug. The top plug provides contact between well cap and sand filling and helps in transfer of load through the sand filling	Remember	CO 5	CLO21	ACE018.21

Signature of the Faculty

HOD, CE