GUJARAT UNIVERSITY-BE SEM VIII-CIVIL ENGG
CE805 FIELD APPLICATION OF GEOTECHNICAL ENGG (EP-II)

Q-1	State and explain 'Skempton's' bearing capacity equation.
Q-2	A rectangular footing 1.5x1.5m rests on a clayey layer at a depth of 1.5m. Determine the safe bearing capacity of soil by 1) Terzaghi's equation 2) Skempton's equation Use E= 18 kN/m^2, Cu= 30 kN/m^2 and factor of safety=2.5.
Q-3	Define 'Foundation modulus'. How it is obtained, Explain in brief.
Q-4	State and explain Terzaghi's bearing capacity equation and state how it differs from Hason's bearing capacity equation.
Q-5	Discuss the effect of contact pressure and rigidity of raft in the analysis of raft foundation.
Q-6	Briefly describe effect of inclination and eccentricity of load on footing.
Q-7	A building has to be supported on R.C, raft foundation of dimension 14mx21m. The soil is clay, having an average unconfined compressive strength of 15 kN/m^2. The pressure on the soil due to the weight of the building and the loads that it has to carry will be 140 kN/m^2 at the base of raft. The building has provision for basement floors. At what depth the bottom of the raft placed to provide a factor of safety 3 against shear ailure? Use skempton's approach for bearing capacity calculations.
Q-8	Discuss various zones of failure in Mayerhoff's theory. How does this theory differ from Terzaghi's theory?
Q-9	Explain effect of inclination of base of foundation and footings on slopping ground on the bearing capacity.
Q-10	A 1.5m size square footing is supported by granular soil at 1.2m depth below existing ground surface. Using Terzaghi's equation, determine the safe bearing capacity of the footind if water table is at the base of footing. Soil properties are γ= 17 kN/m^2, Ø= 37 deg, Nc= 72.96, Nγ= 65.60, F.S.=3.
Q=11	Define Amplitude, Free Vibration, Resonance, Forced vibration Damping, Degree of freedom.
Q-12	A 40 kN vertical compressor foundation system is operated at 40Hz. Foundation soil having Cu= 4x104 kN/m^3. The weight of foundation and weight of soil participating in vibration is 16 kN and 20 kN resp. The base area of foundation is 6m^2. Take damping factor = 0.1. Determine the natural frequency and magnification factor.
Q-13	Write in brief about types of machine & machine foundation.
Q-14	Discuss various dynamic formulae. What are their limitations?
Q-15	Discuss about the degree of freedom of a block foundation.
Q-16	Discuss the general criteria for designing a safe machine foundation.
Q-17	Resonance occurs at a frequency of 20 cps in the vertical vibration of a test block of 1mx1mx1m. Calculate the coefficient of elastic uniform

	compression. The mass of oscillator is 50 kg.
Q-18	Discuss the use of single degree freedom system in the analysis of machine foundations. What are its limitations?
Q-19	Discuss criteria for the design of foundation in the following cases: 1) free vibrations with damping 2) forced vibrations without damping
Q-20	What is meant by vibration isolation? How is it done?
Q-21	Write short note on "Negative skin friction"
Q-22	What is adhesion factor? Why it is used for piles in clay only?
Q-23	Explain principles and methods of placing foundation on expansive soil.
Q-24	Justify the statement: "under-reamed piles provide better solution for foundation in expansive soil". Give codal provisions for under-reamed piles.
Q-25	A 12 m long 300 mm diameter pile is driven in a uniform deposit of sand: Ø= 40º. The water table is at a great depth and is not likely to rise. The average dry unit weight of sand is 18 KN/m^3. Using Nq= 135. Calculate the safe load capacity of the pile with factor of safety 2.5.
Q-26	A concrete pile of 45 cm diameter is driven through a system of layered cohesive soil. The length of pile is 16 m. The following data are available. The water table is closed to the ground surface. Top layer 1: soft lay, thickness = 8m, unit cohesion c= 30 KN/m^2 , adhesion factor α= 0.90. Layer 2: medium stiff, thickness 6m, unit cohesion Cu = 50KN/m^2 and α= 0.75. Layer 3: stiff stratum extends to a great depth unit cohesion Cu = 105 KN/m^2. And α = 0.5. compute Qu and Qa with factor of safety 2.5.
Q-26	Describe in brief types of piles
Q-27	Differentiate between shallow foundation and deep foundation
Q-28	A reinforced concrete pile of soils 30x30 cm and 10 m long is driven into course sand extending to a great depth. The average unit weight of soil is 18KN/m^3. And the average N-value is 15. Detri9ne the allowable load on the pile by making use of the N-value. Use factor of safety.
Q-29	The following are the results of a maintained pile load test on a 400mm dia pile: Load (KN) 200 500 1000 1000 1500 1600 1700 Settlement (mm): 2 4 8 14 22 30 50 Determine the ultimate load and also safe load according to IS:2911(part IV)
Q-30	Differentiate between displacement piles and non-displacement piles. Where would you prefer each?

Q-31	Discuss the factors affecting group efficiency of pile group.
Q-32	Discuss the criteria for determining grip length of a well foundation.
Q-33	Explain with the help of neat diagram, various applications of soil reinforcement.
Q-34	What are the types of soil reinforcement? State the advantages of reinforced earth structures.
Q-35	Name major functions of geotextile and explain anyone in detail.
Q-36	Draw a typical reinforced earth wall and explain the importance of maximum tension line in it.
Q-37	Comment on the following statements: (i) Settlement of a pile group is always more than an individual pile. (ii) The principal effect of negative skin friction is to reduce the factor of safety. (iii) In a pile group the pile driving work should be carried from centre to out ward.
Q-38	Differentiate between skin resistance and tip resistance of pile in clay.
Q-39	Discuss various dynamic formulae. What are their limitations?
Q-40	Discuss the classification of piles.