CLASS: M.TECH.   SEMESTER : I
BRANCH: CIVIL   SESSION : Mo/2023

SUBJECT: CE516 ADV. FOUNDATION ENGG.

TIME: 3 Hours   FULL MARKS: 50

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall. NA

			CO	BL
Q.1(a)	Elaborate on the criteria governing the choice of the type of foundation.	[5]	1	5
Q.1(b)	A footing 1.2m square rests on purely saturated cohesive soil with its base at a depth of 1m below the ground level. The normally consolidated clay stratum is 4m thick & has an unconfined compressive strength of $40kN/m^2$. The clay has a liquid limit of 30%, specific gravity of 2.68, water content = 28%, saturated unit weight of $17.8kN/m^3$. Determine the load which the footing can carry safely with a factor of safety 3 against shear. Compute the settlement that would result if the footing is loaded with this safe load. Assume load spread of 1V : 1H.	[5]	1	5
Q.2(a)	Write a note on strap footing & outline its design procedure.	[5]	2	5

Q.2(b)	Proportion a trapezoidal combined footing for uniform pressure under D.L. & reduced L.L. with the following data :-
	 Allowable soil pressure : $150kN/m^2$ for D.L. & reduced L.L & $225kN/m^2$ for DL & LL
	       Column loads : Exterior column 540kN (DL) & 400kN (LL),
	                   Interior column 690kN (DL) & 810kN (LL).
	 Centre to centre distance of columns = 5.4m & projection of footing beyond exterior column = 0.5m.
		[5]	2	6

Q.3(a)	Explain the mechanics of load transfer in piles & hence discuss on the determination of pile load carrying capacity.	[5]	3	4
Q.3(b)	Develop the procedure for pile group design, providing your judgement.	[5]	3	5
Q.4(a)	With the aid of suitable illustration depict the different components of well foundation which needs to be considered in the design of them & justify their importance.	[5]	4	5
Q.4(b)	Elucidate all the criteria upon which the selection of the depth of a well foundation is based.	[5]	4	5
Q.5(a)	Explicate the different effects of swelling on building foundations.	[5]	5	4
Q.5(b)	Describe the various measures to be employed to make the structure withstand the movement in soils susceptible to swelling.	[5]	5	5

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