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G.R. No.	

Paper Code : P119-113(ESE)

DECEMBER 2019 / ENDSEM
F. Y. M. TECH. (STRUCTURE) (SEMESTER - I)
COURSE NAME: Soil Structure Interaction
COURSE CODE: CVPB11183B
(PATTERN 2018:R1)

Time: [3 Hour] [Max. Marks: 50]

(*) Instructions to candidates:

1) **Answer Q.1, Q.2, Q.3, Q.4 OR Q.5, Q.6 OR Q.7, Q.8 OR Q.9**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is allowed**
4) **Use suitable data where ever required**

Q.1	a)	Enlist geotechnical data we need to design foundation	[3]
		OR	
	b)	What are the general and specific parameters that you will consider to design a foundation?	[3]
Q.2	a)	Explain the important of soil structure interaction	[3]
		OR	
	b)	Sketch contact pressure distribution diagram for flexible base for clayey and sandy soil for surface load	[3]
Q.3	a)	Give examples of plain stress condition	[2]
		OR	
	b)	Give examples of plain strain condition	[2]
Q.4	a)	Explain necessity of designing raft foundation	[6]
	b)	A raft 12 m x 18.0 m in plan has its base 3 m below the surface of a deep deposit of saturated clay. If , γ = 19.0 kN/m3 and the unconfined compressive strength is 80 kPa find the total weight of buildings plus foundations that can be safely supported by the raft.	[8]
		OR	
Q.5	a)	Write down the steps of designing raft foundation	[4]
	b)	Explain the methods of designing raft foundation by considering soil structure interaction. Also enlist assumptions in design process.	[10]
Q.6	a)	Explain soil stress relief method of foundation design	[6]
	b)	Write down the assumption made in subgrade reaction approach for soil structure interaction	[4]
	c)	Draw a sketch of stick and spring-dash pot model of soil structure interaction.	[4]
		OR	
Q.7	a)	Explain two laboratory models of soil structure interaction in detail.	[6]

b) Explain elastic continuum approach of soil structure interaction with sketch [4]

c) How you will minimize the drawback of Winkler model to solve realist problem of soil structure interaction. [4]

Q.8 a) A 13 m long R.C.C. pile is installed in a deposit of uniform sand. The pile head is subjected to a horizontal force of 40 kN. Calculate the deflection of pile head, if coefficient of subgrade modules is 10×10^6 N/m^3. What will be the change in deflection, if the pile head is fixed? [10]
Other data is as follows EI= 3.7×10^7 N-m^2, Ay =2.432 and By =1.023.

b) Explain why analysis of laterally loaded pile is complex problem [4]

OR

Q.9 a) A precast concrete pile 300mm x 300mm square section and 12m long is driven in vertical direction in medium dense sand which is in semidry state. The coefficient of soil modulus variation is 0.008 N/mm^3 and E=2.8×10^7 kN/m^2 for the pile. [10]
A lateral load of 30kN is applied at a height of 2m above ground level. Determine the deflection of pile at ground level if the pile head is i) free ii) restrained (Use Reese and Metlock method)

b) How will you determine modulus of subgrade reaction of soil [4]