Reg. No.												

Question Paper Code	11538

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV/DEC 2022

Fifth Semester

Civil Engineering

20CEPC501 - FOUNDATION ENGINEERING

(Regulations 2020)

Duration: 3 Hours | Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks, K-Level, CO
1.	List the uses of Borelogre port.	*2,K1,CO1*
2.	State the data interpretation made from soil exploration.	*2,K1,CO1*
3.	State the components of settlement.	*2,K1,CO3*
4.	Write the equation to obtain immediate settlement and consolidation settlement.	*2,K2,CO3*
5.	Under which situation combined footings will be adopted.	*2,K2,CO4*
6.	State the requirement of a good foundation.	*2,K1,CO4*
7.	What are the different types of piles according to the material of construction?	*2,K1,CO5*
8.	Describe about under reamed pile? When is it preferred?	*2,K2,CO5*
9.	What do you understand by plastice quilibrium in soils?	*2,K2,CO6*
10.	State critical failure plane.	*2,K1,CO6*

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a)	Illustrate with neat sketch about the geo physical method of soil exploration.	*13,K2,CO1*
		OR	
	b)	Discuss the various factors affecting quality of samples. Explain any two types of soil samplers with neat sketches.	*13,K2,CO1*
12.	a)	The load settlement curve data from a plate load test on a sandy soil areas under:	*13,K3,CO3*

Load,t/m^2	10	20	30	40	50	60	70	80
Settlement, mm	4.5	10	15.5	22	29	38.5	50	64

The size of the plate used was 0.3mx0.3m. Find the size of the square

column footing to carry an load of 250t with a maximum settlement of 25mm.

OR

b) Explain Terzaghi's analysis of bearing capacity of soil in general shear failure with assumptions. *13,K2,CO3*

13. a) Proportion a strap footing for the following data : *13,K3,CO4*

Allowable pressures: 150 kN/m^3 +reduced L.L

225KN/m^3 + L.L

Column loads	Column A	Column B
DL	500kN	600 kN
LL	450kN	800 kN

Proportioning the footing for uniform pressure under DL + reduced LL. Distance of c/c of column =5.4m. Projection beyond column should not be more than 0.5m.

OR

b) Explain in detail about the IS code provisions and recommendations for the design of raft foundation. *13,K2,CO4*

14. a) Explain the following, *7,K2,CO5*

(i) Uplift capacity of pile. *8,K2,CO5*

(ii)Construction of under-reamed piles.

OR

b) A group of 9 piles of diameter 400 mm is spaced at 1.2m c/c in a square pattern. The pile group of length 7.2 m is driven into a clay extending upto 10 m below the ground level. The clay layer is underlain by an incompressible layer. The specific gravity of solids, unit weight and compression index of the clay are 2.65, 18.5 kN/m^3 and 0.18 respectively. Make an estimate of settlement of the pile group if the total load of the pile group if the load on the pile group including pile cap is 1200 kN. Assume the water table to be quite close to the ground level. *13,K3,CO5*

15. a) Discuss in details on the method of estimating the active earth pressure on a retaining wall by using the Culmann's method. *13,K2,CO6*

OR

b) A retaining wall 8 m high, with smooth vertical back, retains a clay backfill with c'=15kN/m^2,ϕ=15°,γ=18kN/m^3.Calculate the total active thrust on the wall assuming that tension cracks may develop to the full theoretical depth. *13,K3,CO6*

PART - C (1 × 15 = 15 Marks)

16. a) A strip footing 2m wide carries a load intensity of 400 kN/m^2 at a depth of 1.2m in sand. The saturated unit weight of sand is 19.5 kN/m^3 and unit weight above water table is 16.8 kN/m^3. The shear strength parameters are C=0 and Φ = 350Nc=57.8, Nq =41.4 and Nγ=42.4. Determine the factor of safety with respect to shear failure for the following cases of location of water table: *15,K3,CO2*

(i) Water table is 4m below G.L

(ii) Water table is 1.2 m below G.L

(iii) Water table is 2.5m below G.L

(iv) Water table is 0.5 m below G.L

(v) Water table is G.L itself

OR

b) Explain in detail about IS code method for computing the bearing capacity of soil with various types of failure and shape factor. *15,K2,CO2*