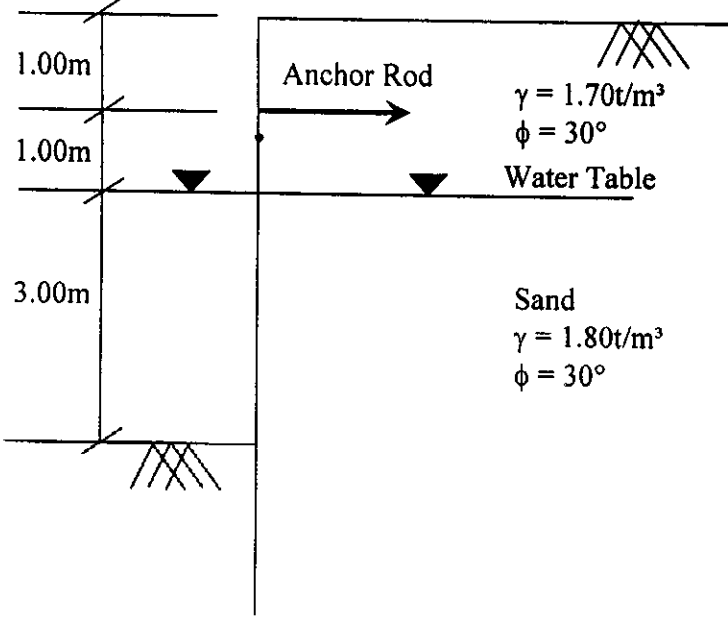


B. E. CONSTRUCTION ENGINEERING 3RD YEAR 2ND SEMESTER - 2018**SUBJECT: UNDERGROUND CONSTRUCTION**

Time : Three Hours

Full Marks : 100

Part I

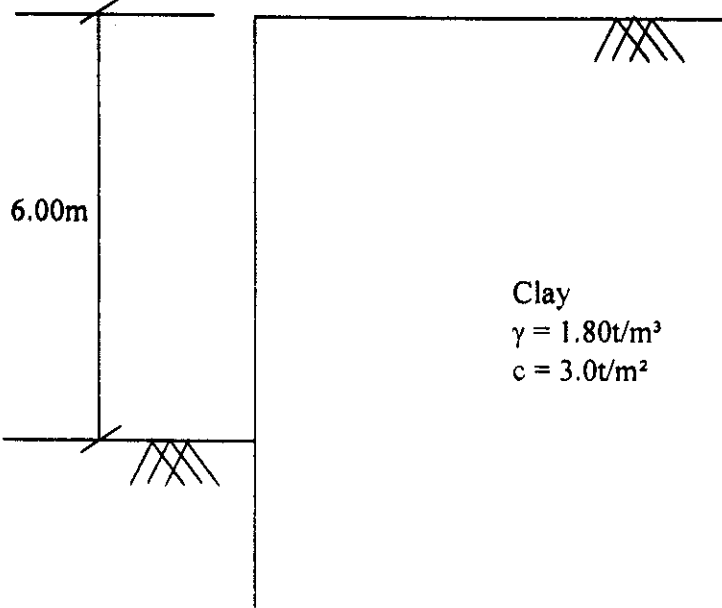
	Question No.		Marks
CO2 [15]		<p>Answer question (1) and any one from question (2a) and question (2b) in this block</p> <p>Q1. Describe the method of dewatering by well point Method.</p> <p>Q2a. Describe in brief different types of cofferdam</p> <p>Q2b. Briefly discuss the process of construction of Diaphragm wall</p>	<p>10</p> <p>05</p> <p>05</p>
CO5 [25]	Q3a.	<p>Answer any one from question (3a) and question (3b) in this block</p> <p>Determine by free earth support method the depth of embedment and the force in the anchor rod of the anchored bulkhead shown in Fig.A.</p>  <p style="text-align: center;">Fig.A</p>	25

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Part I

	Question No.		Marks
	Q3b.	<p>Find the depth of embedment below the dredge line for the cantilever sheet pile shown in Fig.B. Apply 30% increase to the computed embedment depth.</p>  <p style="text-align: center;">Clay $\gamma = 1.80\text{t/m}^3$ $c = 3.0\text{t/m}^2$</p> <p style="text-align: center;">Fig.B</p>	25
CO6 [10]	Q4.	Write a short note on ground settlement in clayey strata.	10

No code is allowed in examination hall.

[Assume relevant data if required]

Different part of the same question should be answered together.

Answer either Question [2 (a)] or Question [2 (b) (i) + 2 (b) (ii)] and

Similarly answer either Question [3 (a) (i) + 3 (a) (ii) + 3(a) (iii)] or Question [3(b)]

CO-1

Q-1. Why a bracing system in a deep cut is necessary ? (5)

CO-2

Q-2 (a) A braced cut [12 m deep and 10 m wide] is to be made in a soft clay layer ($C = 2 \text{ T/m}^2$, $\gamma = 1.85 \text{ t/m}^3$) starts from ground level and continues up to 16 m below ground level , followed by a sandy stratum ($N=15-25$, $\gamma = 1.89 \text{ t/m}^3$). The ground water table at proposed location was found to lie at a depth of 2.5 m below ground level. Design the cut against base failure, bottom heave and clay bursting. It has been recommended for the cut to excavate with 650 mm thick RCC diaphragm wall propped against each other by steel struts with its capacity of 100 ton . If, such struts are placed at a depth of 2m, 5m and 8 m below ground level , then find out the longitudinal spacing of those struts. (25)

OR

(b) (i) Describe Terzaghi's method for determination of earth pressure in braced cut in clayey soil. (18)

(ii) Explain the properties of log spiral with respect to its application in prediction in braced cut. (7)

CO-3

Q-3. (a)(i) Explain arching in soil. (ii) Also illustrate significance of arching in soil with respect to the design of positive projecting conduit. (iii) Define and describe an application of ditch conduit. (4+ 7+ 4)

OR

(b) A deep tunnel [5m wide and 6 m deep] passes through a silty sand deposit [$\gamma = 1.90 \text{ t/m}^3$ $\phi = 25^\circ$] below a river bed at a depth of 30m below bed level. Determine the load on roof of the tunnel and wall and compare those load with and without considering arching. [15]

Q-4. Write notes on negative arching. (5)