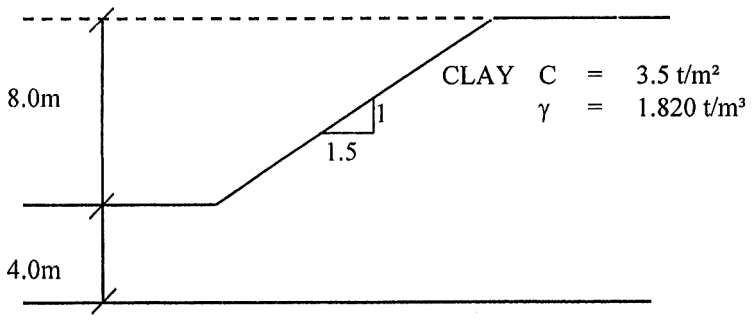
B. E. CONSTRUCTION ENGINEERING 3RD YEAR 1ST SEMESTER SUPPLEMENTARY EXAMINATION - 2024

SUBJECT: SOIL MECHANICS - II

Time : Three hours **Full Marks : 100**

Part I

	Question No.		Marks
COI [25]		**Answer Q1 and any two from Q2, Q3 and Q4.**	
	Q1.	What do you understand by "Soil Investigation"? Why do we carry out Soil Investigation ?	05
	Q2.	Briefly discuss the following i) Core Recovery ii) Rock Quality Designation (RQD) iii) N value from standard penetration test iv) Correction on N value in case of cohesion less soil	10
	Q3.	What are the different information to be furnished in a sub soil investigation report?	10
	Q4.	Describe Auger boring method. Also mention its advantage and disadvantage.	10
CO2 [25]		**Answer Q5 and anyone fromQ6, Q7 and Q8.**	
	Q5.	Fig. A gives the details of an embankment made of cohesive soils. Determine the factor of safety against base failure by midpoint circle method with radius R = 14.00 m.  **Fig.A**	20
	Q6.	Describe the different types of slope failure with suitable sketch	05
	Q7a.	State whether the following statements are 'True' or 'False'.	
	i)	No slope on clean sand can exist with a slope angle greater than angle of friction in loose state irrespective of its height.	01

Ref. No. EX/CON/PC/B/T/313/2024(S)

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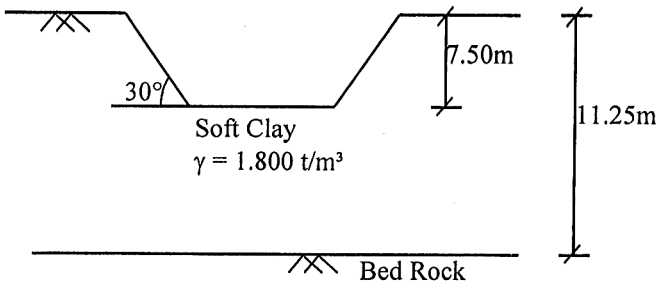
	ii)	Failure of a slope in a cohesionless soil is commonly preceded by the formation of tension crack	01
	iii)	For embankment with clayey soil (ϕ=0), critical height of embankment increases with an increase in slope angle.	01
	Q7b.	Select the correct answer	
	i)	A slope made of cohesive material have the following properties C= 3.0 t/m², γ = 1.800 t/m³ The slope can stand with a vertical surface at least for a short time if the height of the slope is within i) 3.00m ii) 6.00m iii) 9.00m iv)12.00m	01
	ii)	An earthen dam of height H is made of cohesive soil whose cohesion and unit weight are c and γ resectively. If the factor of safety against cohesion is Fc, the Taylor's stability No Sn is a) $\frac{\gamma H}{CFc}$ b) $\frac{Fc\gamma H}{C}$ c) $\frac{C}{Fc\gamma H}$ d) $\frac{CFc}{\gamma H}$	01
	Q8.	A wide cut was made in a stratum of soft clay that had a level surface as shown in Fig. B. The side of the cut rise at 30° to the horizontal. Bed rock was located at a depth of 11.25m below the original ground surface. When the cut reached a depth of 7.50m, failure occurred. If the unit weight of the clay was 1.80 t/m³, what was the average cohesion of the clay layer? Assume stability number Ns = 0.16  **Fig. B**	05