Course No: CVL 2402
Course Title: Foundation Engineering
Date: 19/01/2014
No. of Questions: (5)
Time: 2.5 hr
Using Calculator (Yes)

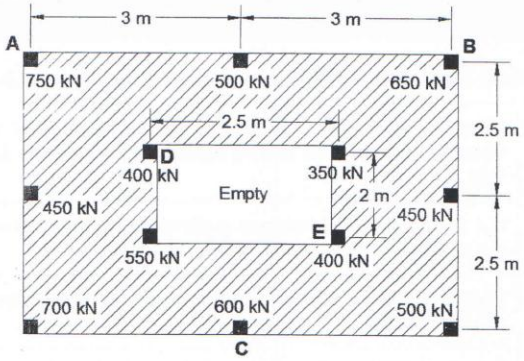
University of Palestine

Final Exam
First semester
2014/2015
Total Grade: 60

Instructor Name: Dr. Sari Abusharar
Student No.: _____
Student Name: _____
College Name: Engineering
Dep. / Specialist: Civil Engineering
Using Dictionary (No)

Second Question 15/60

The plan of a mat foundation is shown below. Calculate the soil pressure at points A, B, C, D, and E only. (Note: All column sections are planned to be 0.4 m x 0.4 m).



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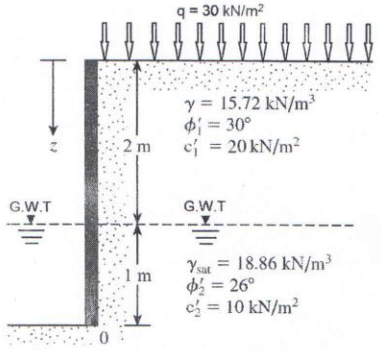
Third Question 15/60

For the 3-m high wall shown below, (a) draw the Rankine pressure distribution diagram, (b) estimate the resultant force per unit length of the wall, and (c) estimate the location of the resultant.



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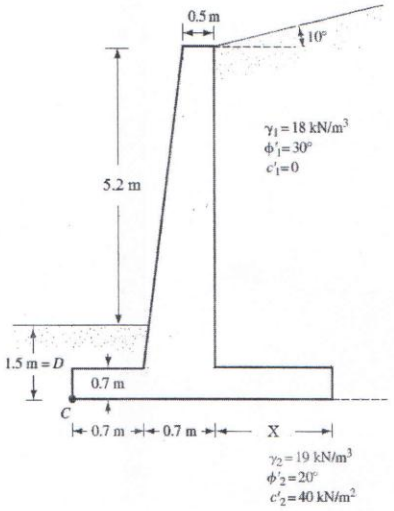
Fourth Question 10/60

For the cantilever retaining wall shown below, determine the value of X in meter that achieves the overturning check only. Use $\gamma_{concrete} = 23.58$ kN/m^3.



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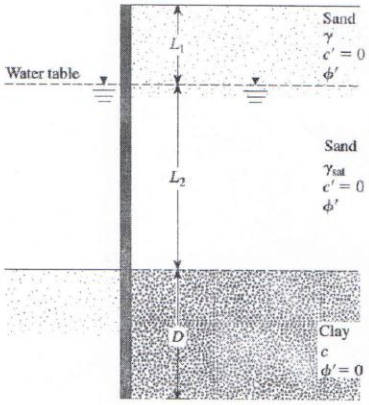
Fifth Question — 10/60

The figure below shows a cantilever sheet pile wall penetrating into saturated clay. Let $L_1 = 2.4$ m, $L_2 = 4.6$ m, $\gamma = 15.7$ kN/m^3, $\gamma_{sat} = 17.3$ kN/m^3, $\emptyset' = 30°$, and $c = 29$ kN/m^2.

a. What is the theoretical depth of embedment, D?
b. What length of sheet piles need if increase D by 50%?
c. Determine the minimum size of sheet pile section necessary. Use $\sigma_{all} = 172.5$ MN/m^2.



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End of Questions
Good Luck

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This is a closed book exam

Answer All Questions

	60

First Question 10/60

A. Mark each of the following statements True (T) or False (F) **(5/10)**

1.	Cantilever footings may be used in place of trapezoidal or rectangular combined footings when the allowable soil bearing capacity is high and the distances between the columns are tight.	
2.	Mat foundations are sometimes preferred for soils that have low load-bearing capacities, but that will have to support high column or wall loads.	
3.	The net allowable pressure applied on a foundation increases by increasing the depth of embedment.	
4.	For a backfilled cantilever type, the sheet piles are driven into the soil after dredging the in situ soil in front and back of the proposed structure.	
5.	When the backfill of the retaining walls is reinforced by reinforcement materials which are generally referred to as mechanically stabilized earth walls.	

B. A mat foundation on a saturated clay soil has dimensions of 20 m x 30 m. Given: dead and live load = 50 MN, and γ_{clay} = 18.5 kN/m^3. Find the depth, D_f, of the mat for a fully compensated foundation. **(5/10)**