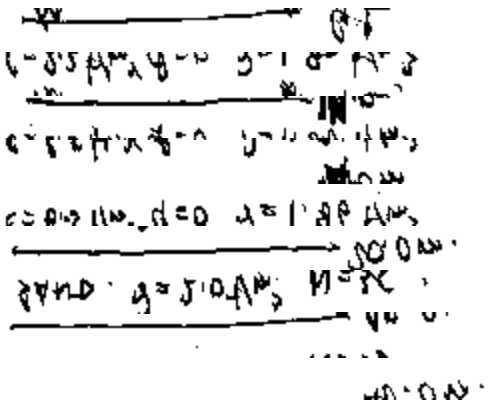
6. (a) A braced ent is to be made in a sub-soil profile as given below. The ent is 12m deep and 16m wide. 20



(i) Design suitable penetration of diaphragm wall

(ii) Is the ent safe against clay brushing? If not recommend suitable remedial measure.

(iii) Draw the apparent earth pressure diagram on the wall.

(iv) If the allowable shut load is 140 ton then find out suitable vertical and horizontal spacing of shuts.

(b) Explain why the adjacent structure to a deep cut is prove to damage and distress. 5

—— X ——

Ex/CON/T/423/123/12

BACHELOR OF CONSTRUCTION ENGG. EXAMINATION, 2012

(4th Year, 2nd Semester)

Underground Construction

Time : Three hours. Full Marks : 100
(50 marks for each part)

Use a separate Answer-Script for each part.

PART - I

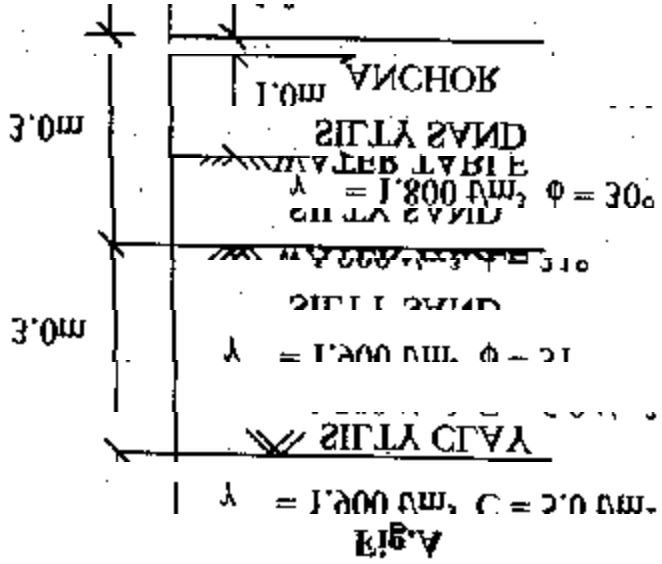
Answer any ***two*** questions.

1. (a) A 12.0m deep braced excavation, 40m x 40m in plan, is to be made in a sub-soil consisting of 20.0m of medium sand overlying hard clay. The ground water table is 3.0m below ground level and it is to be lowered to at least 1.50m below the bottom of excavation. What will be the average discharge of the dewatering system in liters/hours?
Assume $k=2.5 \times 10^{-2}$ cm/sec. 10

(b) Describe the process of construction of Diaphragm walls. 10

(c) State the different uses as well as advantages of Diaphragm walls. 5

2. Find by free earth support method the depth of embedment below the dredge line for the anchored sheet pile shown in Fig A. Use a 30% increase applied to the computed embedment length. Also find the anchor rod forces. 25



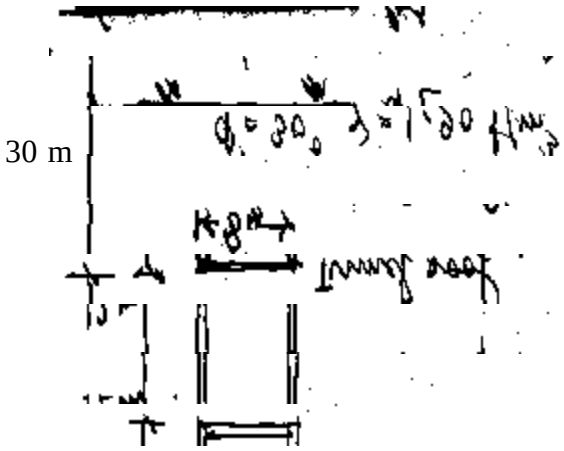
3. Write short notes on :
   (a) Ground settlement in clayey strata. 10
   (b) Dewatering by well point method. 15

PART - II

Answer any ***two*** questions.

4. (a) Explain Terzaghi's General Wedge theory for earth pressure in cuts in cohesionless soil. 15
   (b) Describe various types of bracing system used for deep and shallow ent. 10

5. (a) A tunnel section has been shown below. Find out the load on the roof and wall of the tunnel considering arching and compare such load reduction if arching would have not been considered. 12



   (b) Explain the principle of load determination on the top of a Ditch Conduct. 8
   (c) Explain settlement ratio. 5