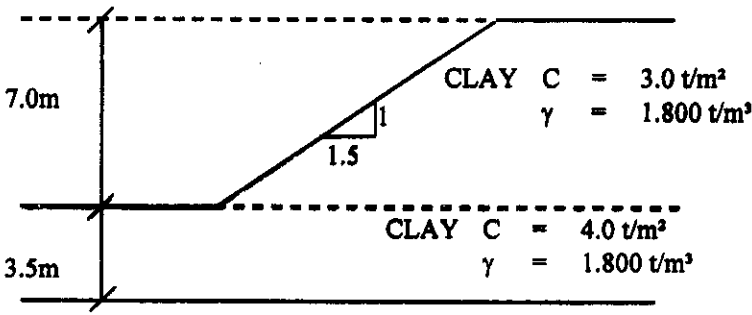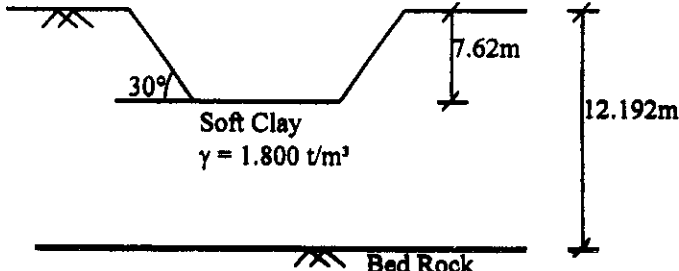**B.E.CONSTRUCTION ENGINEERING THIRD YEAR FIRST SEMESTER-2018**

SUBJECT SOIL MECHANICS II

Time : Three hours

Full Marks : 100

50 marks for each part
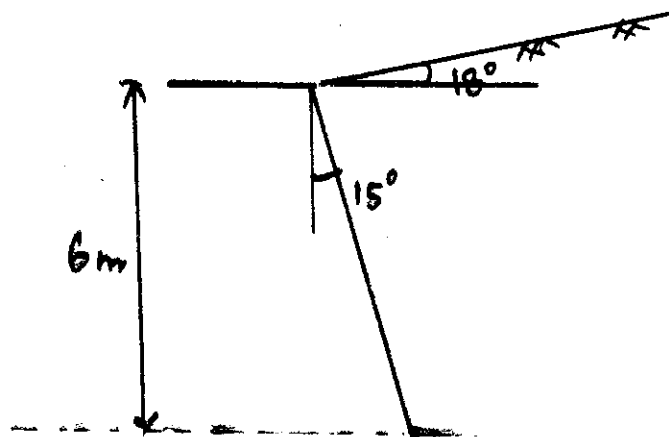
No of Questions	Part I / Part II	Marks
	Answer any **two** questions.	
Q1.	Fig. A gives the details of an embankment made of cohesive soils. Determine the factor of safety against base failure by midpoint circle method with radius $R = 13.50$ m. **Fig.A**	25
Q2a.	Briefly discuss the practices followed in selecting the number and depth of bore holes in a project.	10
Q2b.	A wide cut was made in a stratum of soft clay that had a level surface as shown in Fig. B. the size of the cut rise at 30° to the horizontal. Bed rock was located at a depth of 12.192m below the original ground surface. When the cut reached a depth of 7.62m, 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 = 6 **Fig. B**	05
Q2c.	Describe wash boring method. Also state its advantages and disadvantages.	10
Q3.a.	Describe the different methods of stabilization of bore holes.	10
Q3.b.	Define SPT value	05
Q3.c.	State the different corrections that are generally applied on field N-value in case of cohesion less soil.	10

B.E. Construction Engineering - Third Year - First Semester **Ref. No.: Ex/CON/T/312/2018**

Answer any two questions.

Q-1(a) Explain why two equipotential lines can't meet each other ?   (5)

(b) Explain the significance of Laplace equation in two dimensional fluid flow.   (10)

© Describe the requirements of filters to arrest failures of foundation which may occur due to

seepage.   (10)

Q-2(a) Define and determine the critical hydraulic gradient in terms of geotechnical properties of

soil ?   (5)

(b) Define various types of earth pressures on retaining wall. Which type of pressure on retaining

wall is generally considered as design earth pressure and why ?   (5)

(c) Explain difference of Columb's and Rankine's earth pressure concept.   (5)

(d) A retaining wall 8m high with vertical back retaining cohesion less soil as backfill ($\varphi = 32^0$,

$\Upsilon = 1.92$ t / m^3) and surcharge of 10t/m .The ground water table was found to lie at a depth of 3.0

m from top. Determine the lateral earth pressure under at rest condition on the wall and also the

point of application of resultant force on the wall.   (10)

Q-3 (a) The retaining wall shown in Fig-A retains a soil with following properties. The backfill

is sloping at an angle of 18^0 to the horizontal.[$\varphi = 34^0$, $\Upsilon = 1.94$ t /m^3 , $\delta = 20^0$] Determine the

total active thrust by Culmann's method.   (20)

(b) Write notes on vertical cut off in a hydraulic structure.   (5)

(FIG- A)