Reg. No.										

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VI SEMESTER B.TECH. (CIVIL ENGINEERING)
END SEMESTER EXAMINATIONS, APRIL/MAY 2017
SUBJECT: GROUND IMPROVEMENT TECHNIQUES [CIE 4010]
REVISED CREDIT SYSTEM

(29/04/2017)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitable assumed.

Q.No	Questions	Marks	CO
1A.	Explain in detail the properties of compacted cohesive soil	**4**	**CO1**
1B.	Standard compaction of a highly plastic tropical black clay (liquid limit=55%, plasticity index=30) at various water contents produced the following dry densities. w(%) 16 18.5 22 23.5 25 27.5 31 γdry(kN/m^3) 1.47 1.5 1.54 1.54 1.50 1.45 1.41 The specific gravity of the soil solid is 2.71 (a) Plot the ZAV curve for the appropriate water content and density range (b) Plot the results and draw the compaction curve (c) Determine the optimum moisture content, maximum dry density and corresponding saturation.	**6**	**CO2**
2A.	Water is pumped from a 20 m thick confined aquifer at a rate of 2000m^3/day from a single well. In an observation hole at a distance of 70 m from the well the drawdown after 10 minutes of pumping was 0.66m; after 1000 minutes, it was 1.92m. Calculate the coefficient of permeability (m/day)	**4**	**CO2**
2B.	Given are the following details pertaining to a preloading project: Surcharge; Δp=80kPa Consolidating soil; w=50% Liquid Limit=71 % Plasticity index=47% γ=1.7t/m^3 Cc=0.7 Cv=0.6m^2/year Ch=1.2m^2/year L=20m (longest drainage path) Sand drains; d=0.1 m s=2 m (triangular spacing) Determine the consolidation ratio after 10 months of preloading	**6**	**CO2**

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3A.	What is the role of admixtures in pavement design? Write an essay on mechanistic design approach for flexible pavements.	**5**	**CO1**
3B.	Discuss the need for constructive use of industrial waste materials such as fly ash and slag.	**5**	**CO2**
4A.	Discuss the failure modes of reinforced earth mass.	**5**	**CO1**
4B.	Predict the pullout force of an anchored earth reinforcement element. Soil internal friction angle=35° Soil unit weight=19kN/m^3 Depth of fill=4m Triangular anchor element width=0.65m, angle α =70° Rods=4m long, 20mm thick	**5**	**CO1**
5A.	Write a note on soil nailing with the help of figures.	**5**	**CO1**
5B.	Discuss the applications of ground anchors and rock bolts with the help of figures.	**5**	**CO1**