Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
A Constituent Institution of Manipal University

VI SEMESTER B.TECH. (CIVIL ENGINEERING)

END SEMESTER EXAMINATIONS, APRIL/MAY 2017

SUBJECT: GROUND IMPROVEMENT TECHNIQUES [CIE 4007]

REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

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

Q	QUESTIONS	MARKS	CO
1A.	Discuss the methods of compaction.	**5**	**CO1**
1B.	Write a note on the compaction control tests.	**5**	**CO1**
2A.	A land reclamation project requires 3m of sand-gravel fill (unit weight=18kN/m³) to be placed on a deposit with the following profile. Ground water level is at the surface. **0 to 6 m : Soft silty clay** w=65% Gs=2.7 Cc=1.0 Cv=1m²/year Cu=20kPa **>6 m : Dense shale** (a) Estimate the final settlement, Sf (b) Calculate the time t90 required for 90% of the settlement, Sf to take place.	**6**	**CO2**
2B.	Write a note on “Clogging criterion based on gradient ratio tests”.	**4**	**CO2**
3A.	Write a note on the mechanical stabilization and fixation of petroleum wastes.	**4**	**CO2**
3B.	Elucidate the properties of flyash and explain how they are relevant in the context of modification by admixtures.	**6**	**CO1**
4A.	Discuss the statement by considering the different methods of grouting, “Some experts maintain that penetration grouting is adequate for the treatment of most foundations; others see the occurrence of hydraulic fracturing of the ground not only as inevitable, but necessary for thorough Impregnation”.	**4**	**CO1**
4B.	What is ground freezing? Explain the properties of frozen ground.	**6**	**CO1**
5A.	Write a note on the revised standard analysis of reinforced earth.	**5**	**CO2**
5B.	Estimate the pull out resistance of a 3m long, 1m wide section of geogrid with an effective soil-grid friction angle of 30^0 under 3m of soil. The soil has an internal friction angle of 40^0 and a unit weight of 18kN/m³. The grid is 2mm thick and there are 8 transverse elements per m length.	**5**	**CO2**