



MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL (A constituent unit of MAHE, Manipal)

VI SEMESTER B.TECH. (CIVIL ENGINEERING)

END SEMESTER EXAMINATIONS, APRIL/MAY 2018

SUBJECT: GROUND IMPROVEMENT TECHNIQUE [CIE 4010]

REVISED CREDIT SYSTEM

(/ / 2018)

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

✤ Answer ALL the questions.

✤ Missing data may be suitably assumed.

Q. No	Question Statement	Marks	CO
1A.	What is ground improvement? What is the need for the ground improvement?	3	CO1
1B.	Briefly discuss the classification of ground improvement techniques.	3	CO1
1C.	When soil exploration was carried out in a site, it was found that it is a completely saturated loose sandy soil upto a depth 12m below the ground level. The site is situated in an earthquake prone zone. It is proposed to construct a structure to be earthquake resistant. What is the likely problem the foundation soil will be subjected to? How can the ground be modified to overcome the anticipated problem? Explain with neat sketches the method adopted.	4	CO5
2A.	Explain compaction using explosives and heavy tamping.	3	CO2
2B.	Explain vibro compaction method of soil improvement with the help of a neat sketch. What are its limitations?	3	CO2
2C.	What are the reactions involved in soil cement stabilization? What are the types of soils that can be stabilized by cement? Why?	4	CO2
3A.	Explain stabilization using i) Bitumen ii) Flyash	3	CO2
3B.	Explain the different methods of compaction control for surface compaction in field.	4	CO2
3C.	Discuss advantages and disadvantages of thermal modification(both heating and freezing).	3	CO3
4A.	Compute the average degree of consolidation for soft clay after 7months of applying surcharge of 110 kN/m ² . Sand drains of diameter 250mm at spacing 2.2m arranged in square pattern. Given thickness of soft clay layer is 14m (double drainage case), C _v =0.5m ² /year and C _{vr} = 1.5 m ² /year. Cc = 0.75. What is the change in degree of consolidation if the sand drains are arranged in triangular pattern?	3	CO3
4B.	List and explain the different dewatering systems.	5	CO3

Reg. No.



MANIPAL INSTITUTE OF TECHNOLOGY

(A constituent unit of MAHE, Manipal)

4C.	What are PVD's? State the advantages of PVD's?	2	CO3
5A.	Explain Compaction grouting and jet grouting.	4	CO4
5B.	What is reinforced soil? What are the applications of reinforced soil?	3	CO4
5C.	Explain the applications of geosynthetics in erosion control and confinement.	3	CO4