

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Regular), 2016

B. Tech in Civil Engineering, Semester VII

Roll No.....

CE735 : Ground Improvement Technique

Time: 3 hours

Max. Marks: 100

Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.
4. Answer should be precise and to the point only

Q.1A Objective type multiple choice questions (10 questions @ 1 mark)

10

- i. When a cohesionless soil attains quick condition, it looses
 - (a) shear strength
 - (b) bearing capacity
 - (c) both (a) and (b)
 - (d) Neither (a) nor (b).
- ii. Pick up the correct statement from the following:
 - (a) A maximum value of dry density is obtained at optimum water content
 - (b) At low value of water content most soils tend to be stiff.
 - (c) An airless soil will have maximum possible value of dry density for the given water content
 - (d) All the above.
- iii. What is the minimum plate size considered in plate load test?
- iv. Write approximate formula for the allowable bearing capacity of stone columns.
- v. Pick up the commonly adopted geophysical method in civil engineering from the following
 - (a) The seismic method
 - (b) Electrical resistivity method
 - (c) Gravitational method
 - (d) Magnetic method
 - (e) both a and b
- vi. Black cotton soil is unsuitable for foundation because its
 - (a) Bearing capacity is low
 - (b) Permeability is uncertain
 - (c) Particles are uncertain
 - (d) Property to undergo volumetric change due to variation of moisture content
- vii. Plot the dry densities ρ_d versus water contents w for compacted sample is called
- viii. What is weight and height of blow considered for standard penetration test?
- ix. Define drainage of sloping.
- x. Geomembrane lining products are ideally suited for construction of landfills to store hazardous waste products. (State True or False)

Q.2 Short answer type questions (4 questions @ 2.5 marks)

10

- i. Define challenging soil and expansive soil. Give one example.

ii.	What type of materials are considered for grouting? Give atleast two example of each type.	
iii.	What are construction methods considered for cement soil stabilization?	
iv.	Write method of blasting in ground improvement technique.	
Q.3A	Compare the salient features of samples compacted on dry side of optimum in contrast with samples compacted on wet side of optimum.	05
Q.3B	What are vertical drains? Explain the different types of vertical drains and its efficiency as applied to soil and procedure of installation of vertical sand drains.	05
Q.4A	Briefly write the role played by ground improvement Technique in foundation engineering	05
Q.4B	What are the factor to be considered in the selection of the best ground improvement technique? Discuss in detail.	05
Q.5A	Write in brief about (a) Vibro-Compaction (d) Pre-loading with vertical drains	05
Q.5B	Write procedure for installation of sand compaction piles.	05
Q.6A	Explain how bearing capacity of soil is improved with the help of geotextiles?	05
Q.6B	Briefly explain the dynamic compaction method with technical specification of the equipment.	05
OR		
Q.6B	Which soils are preferred for dynamic compaction? How to determine the depth of improvement in dynamic compaction? Write the applications of dynamic compaction.	1.5 + 2 + 1.5
Q.7A	Briefly describe the mechanism of soil reinforcement. Also explain the direct stress test example of unreinforced and reinforced sample.	05
Q.7B	Draw all the internally stabilized system of soil reinforcement. Also label it.	05
OR		
Q.7B	Why CaCl_2 is used in chemical stabilization? How sodium chloride is used in stabilization method?	3+2=5
Q.8A	Explain the installation method of stone columns. (Vibro Compaction Method and Ramming Method)	10
Q.9A	Drainage (or) dewatering is the popular technique for consolidating saturated cohesive soils in-situ. Comment on the statement and discuss the difficulties in designing a drainage system. Show how a well point system works with the help of a sketch.	10
Q.9B	Draw the failure mode of stone columns in a group and Stone Column loaded over an area greater than that of the column. What are the parameters considered in failure of stone columns.	10
OR		
Q.9B	What conditions are preferable for vibroflotation method? Explain the vibroflotation method along with a simple figure.	10