



Name : .....

Roll No. : .....

Invigilator's Signature : .....

**CS/B.Tech (CE-NEW)/SEM-8/CE-802/1/2010**

**2010**

**SOIL STABILISATION &  
GROUND IMPROVEMENT**

Time Allotted : 3 Hours

Full Marks : 70

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words  
as far as practicable.*

**GROUP – A**

**( Multiple Choice Type Questions )**

1. Choose the correct alternatives for any *ten* of the following : 10 × 1 = 10

- i) Standard proctor test is done to determine
  - a) compaction                      b) consolidation
  - c) shear strength                  d) none of these.
- ii) In surface compaction, which of the following is needed ?
  - a) A vibrofloat                      b) A roller
  - c) Geo-synthetics                  d) Sand pile.
- iii) The technology to improve ground by injecting fluid like material into subsurface soil is known as
  - a) grouting                          b) vacuuming
  - c) heaping                          d) compacting.



- iv) In cohesive soil which of the following methods of stabilization is applicable ?
- a) Compaction                      b) Stone column
- c) Vibroflotation                  d) Blasting.
- v) Vibroflotation is an efficient technique to stabilized
- a) highly compressive soil
- b) cohesion less soil
- c) clay
- d) none of these.
- vi) Preloading is the method of stabilization in which pore water pressure is increased so the effective pressure is
- a) decreased                      b) remaining same
- c) increased                      d) none of these.
- vii) Capacity of soil to transmit a fluid to pass through its interconnected void is known as
- a) seepage                      b) shear
- c) permeability                  d) none of these.
- viii) For spacing of sand pile  $S/d$  is in the range of ..... is applicable with accuracy.
- a) 2 to 6                      b) 1.5 to 4
- c) 1.5 to 3                      d) 2.5 to 4
- ix) Geo-synthetics-soil reinforcement may be applied in
- a) roads                      b) earth retaining wall
- c) slopes                      d) both (b) & (c).



- x) Rock & cable anchor is used in
  - a) lowering the water table
  - b) slope stabilization
  - c) pavement
  - d) sandy soil stabilization.
- xi) Well point systems are installed in
  - a) compaction
  - b) consolidation
  - c) drainage & dewatering
  - d) preloading process.
- xii) The aim of soil stabilization is to increase the
  - a) seepage
  - b) bearing capacity
  - c) shear strength
  - d) both (b) & (c).

**GROUP – B**

**( Short Answer Type Questions )**

Answer any *three* of the following.  $3 \times 5 = 15$

- 2. Explain the term 'Reinforced Earth'. Enumerate the advantages of reinforced earth.
- 3. Write short notes on soil improvement by thermal treatment.
- 4. What do you mean by the term 'Dewatering' ? Discuss briefly.
- 5. Write short notes on 'Cement Stabilization'.
- 6. Discuss various compaction equipments for surface compaction in field.
- 7. Can one use a geomembrane as a separator instead of a geotextile beneath a road ?



**GROUP – C**

**( Long Answer Type Questions )**

Answer any *three* of the following.

3 × 15 = 45

8. From given figure

Compute :

- a) the time for 90% consolidation of the soft clays without sand wicks
- b) the time for 90% consolidation with sand wicks

Given that the spacing of sand wicks is 1 m on a triangular grid and diameter of sandwicks is 100 mm.

- 9. What is grouting ? Describe one method of grouting with neat sketch.
- 10. What is soil reinforcement ? How does it stabilized the soil ?
- 11. What are vertical drains ? Describe with neat sketch.
- 12. What is chemical stabilization of soil ? Why is it used ? How many types of chemical are generally used ?
- 13. Compare the use of Sheep's foot and vibratory rollers in the surface compaction of granular soils.

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