

Total number of printed pages-4

53 (CE 712) SSGT

2014

SOIL STABILISATION AND GROUND IMPROVEMENT TECHNIQUE

Paper : CE 712

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

Answer any five questions.

1. (a) Define the following terms : *(any five)*
Compaction, Soil Stabilization, Well points, Groutability, Geomembrane, Underpinning. 10
- (b) Differentiate Standard Proctor Test from Modified Proctor Test. 5
- (c) What do you mean by 'Sand Drain' ? How sand drain is installed ? Differentiate free strain and equal strain case. 5
2. (a) Discuss the factors that influence the outcome of field construction of stabilized road. 10

Contd.

- (b) The following data are obtained in a compaction test. Specific gravity = 2.65

Moisture Content	%	2	4.2	5.5	6.6	7.5	10
Wet Density	kN/m^3	20.2	20.8	21.7	22.0	22.1	22

Determine the optimum moisture content and maximum dry density. Draw zero air void line. 10

3. (a) A moist soil sample compacted into a mould of 1000cm^3 capacity and weight 35N , weighs 53.5N with the mould. A representative sample of soil taken from it has an initial weight of 0.187N and oven dry weight of 0.1691N . Grain Specific Gravity is 2.65. Determine 10

(i) Water Content

(ii) Wet Density

(iii) Dry Density

(iv) Void Ratio

(v) Degree of Saturation of sample.

- (b) Explain different field compaction techniques. 10

4. (a) What do you mean by 'Stone Column' ?
How it is installed with jetting fluid
mechanism ? What kind of soil is generally
suitable for stabilization with stone column ? 5
- (b) Discuss different methods used for
construction of stabilized roads. Also write
their advantages and disadvantages
concurrently. 10
- (c) What are the basic items required for a
grouting plant ? Also write their fundamental
functions. 5
5. (a) Explain different grouting materials. Write
down the different applications of grout
adopted for both temporary and permanent
works. 10
- (b) What are the basic functions involved in soil
and rock grouting ? Explain how grouting is
carried out with cement mixers. 10
6. (a). Explain different injection methods adopted
in grouting process. 10

(b). What do you mean by 'Geosynthetics'?
What are the different properties of Geosynthetics? Write the main functions of Geosynthetics used in civil engineering field.

10

7. (a) Explain different applications of Geosynthetics in civil engineering field with sketches.

10

(b) What do you mean by 'Soil Reinforcement'? Explain different materials required in the construction of soil reinforcement structure. What are the different applications of soil reinforcement in ground improvement?

10

8. Write short notes on : **(any four)**

20

(a) IS specified compaction test

(b) Chemical Stabilization by lime

(c) Bitumen Stabilization

(d) Compaction Grouting

(e) Soil Nailing.