Total Pages—4

B. Tech - 8

GIT

Set-1

GROUND IMPROVEMENT TECHNIQUE

Full Marks : 70

Time : 3 hours

Q. No. 1 is compulsory and answer any **five** from the rest

The figures in the right-hand margin indicate marks

Assume suitable data if needed

1. Answer *all* the questions : 2 × 10

   (*a*) What is "zero air void line" ? Write the expression for it.

   (*b*) What are the causes for which ground improvement techniques are undertaken ?

   (*c*) Write the names of admixtures used for improving ground.

   (*d*) Describe the functions of geotextiles.

   (*e*) Write down how geocells are formed and what are its categories ?

(Turn Over)

(*f*) How blasting helps in deep compaction ?

(*g*) Which type of soil are suitable for lime fly ash stabilization ?

(*h*) What are the methods that are adopted in the field for rapid moisture content determination ?

(*i*) What is the specification for light compaction test ?

(*j*) Which type of rollers are most effective in compacting clayey soils ?

2. (*a*) What do you mean by "compaction " ? What are the benefits obtained through compaction ? 2

(*b*) Describe the methods briefly to determine the compaction in the field ? The maximum and minimum dry unit weights of a sand were determined in the laboratory to be 18·1 kN/m^3 and 15·25 kN/m^3. What would be the relative compaction in the field if the relative density is 64 % ? 8

3. (*a*) Describe various ground improvement techniques applicable to both surface layer as well as thick layer of soil. 4

(*b*) Describe briefly any three techniques of ground improvement for deep layer of soil. 6

4. Describe various methods of Dewatering. 10

5. (*a*) Write brief critical notes on methods suitable for stabilizing black cotton clay. 5

(*b*) Following are the details of backfill material used in vibroflotation project. $D_{10} = 0{\cdot}36$ mm, $D_{20} = 0{\cdot}52$ mm, $D_{50} = 1{\cdot}42$ mm. Determine the suitability number S_N. What would be its rating as a backfill material ? 5

6. (*a*) Why grouting is carried out and in which situation it is applicable ? 3

(*b*) Describe briefly on : 7

(*i*) Groutability

(*ii*) Cement grouting

(*iii*) Compaction grouting.

7. (*a*) Write briefly on lime stabilization procedure. 5

(*b*) Write down the mechanical properties of geosynthetics which are related to geosynthetic survivability and separation function. What are the laboratory tests conducted for the above properties ? 5

8. (*a*) What are geosynthetics and what are the common types of geosynthetics that are used in practice ? 3

(*b*) Write the reinforcing mechanism of geogrid with neat sketch. 7
