22404

12223

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answer with neat sketches wherever necessary.

(4) Assume suitable data, if necessary.

(5) Use of Non-programmable Electronic Pocket Calculator is permissible.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following: **10**

a) Define Geology and Mineralogy.

b) Define soil as per IS 2809-1972.

c) Define water content and specific gravity of soil.

d) Define active earth pressure and passive earth pressure.

e) State any two compaction equipments used for soil compaction.

f) Define void ratio and porosity.

g) State any two field situation where compaction is required.

Marks

2. Attempt any THREE of the following: **12**

a) Explain experimental procedure of determination of specific gravity of soil by pycnometer as per IS 2720, part 3.

b) A soil sample has porosity 35% and specific gravity of 2.69. Calculate void ratio and dry density.

c) Calculate co-efficient of uniformity and co-efficient of curvature for a soil sample for which D_{10} = 0.230 mm, D_3 = 0.600 mm and D_{60} = 1.00 mm.

d) State uses of particle size distribution curve.

3. Attempt any THREE of the following: **12**

a) State and explain the factors affecting permeability of soil.

b) State any four assumptions made in Terzaghi's analysis.

c) State and explain the methods of improving the bearing capacity of soil.

d) State the characteristics of a flow net.

4. Attempt any THREE of the following: **12**

a) Calculate active and passive earth pressure at depth of 8 m in dry cohesionless soil with an angle of internal friction of 30° and unit weight of 16 kN/m^3.

b) Differentiate between compaction and consolidation.

c) Differentiate between standard and modified proctor test as per IS 2720.

d) Explain procedure for determination of falling head Permeability Test.

e) Following readings were taken in a direct shear test on a soil sample.

Normal stress N/mm^2	0.1	0.2	0.3	0.4
Shear stress N/mm^2	0.120	0.150	0.195	0.240

Determine the value of c and ϕ.

Marks

5. Attempt any TWO of the following: **12**

a) State classification of various rocks based on their genesis.

b) Define flow net and state applications of flow net.

c) Explain the sieve analysis test for grading of soil with the help of particle size distribution curve.

6. Attempt any TWO of the following: **12**

a) A constant head permeability test gives discharge of 250 ml in 210 seconds under a constant head of 600 mm. Determine the permeability if the soil sample was 100 mm long and 78.5 cm^2 in area.

b) Calculate the OMC and MDD values for the soil sample having following data using graph paper.

Bulk density in gm/cc	1.2	1.75	1.90	2.30	2.15	2.0
Moisture content in %	5	10	15	20	25	30

c) State necessity of site investigation and explain in brief the types of exploration.