314315

12526

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) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

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

(7) 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 :–

i) Soil as per IS

ii) Geology

b) State classification of rocks based on their Genesis.

c) Define the following terms :–

i) Phreatic line

ii) Flow net.

d) State any four factor affecting permeability of soil.

e) List the methods of soil stabilization.

f) State the necessity of compaction of soil. (Any two points)

g) State significance of CBR in Road Construction work.

P.T.O.

Marks

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

a) Describe the necessity of site investigation in four points.

b) Explain the importance of geology in Civil Engineering Construction in four points.

c) Define :–

i) Water content

ii) Degree of saturation

iii) Voids ratio

iv) Porosity.

d) Draw particle size distribution curve for well graded. Gap graded and uniformly graded soils fine grained and coarse grained soils.

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

a) Explain the procedure for determination of dry density of soil by core cutter method.

b) Explain laboratory method of determination of shear strength of soil by direct shear test.

c) State field situations of shear failure in respect-slope, surcharge, foundation, subgrade.

d) Differentiate between compaction and consolidation of soil. (Any four points)

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

a) Explain standard proctor test to determine MDD and OMC of soil with graph.

b) Explain any two methods of soil investigation.

c) Enlist the tests for field identification of soil and explain any one in brief.

d) Explain effects of water table on bearing capacity of soil in four points.

e) Write the criteria for deciding the location and number of test pits and bore holes for soil exploration for any four constructions works.

Marks

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

a) A soil sample of volume 160 CC, weights 304 gms, when partially saturated. It weights 269.28 gms. When fully dry. Specific gravity of soil is 2.64. Determine porosity. Void ratio, Water content and degree of saturation.

b) i) State meaning and subdivisions of course grained soil and fine grained soil as per IS soil classification.

ii) Calculate coefficient of uniformity Cu and coefficient of curvature Cc for a soil particles of D10 = 0.2 mm, D30 = 0.8 mm, D60 = 2 mm. Also classify and grade of soil.

c) In specific gravity test the following data is obtained at room temperature of 27°C :–

i) Mass of Pycnometer = 680 gm.

ii) Mass of Pycnometer + water = 720.26 gm.

iii) Mass of Pycnometer + soil solids and water = 750.36 gm.

iv) Mass of Pycnometer + soil solids = 727.25 gm.

Determine the specific gravity of soil solids.

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

a) In the direct shear test the following observations were made–

Normal Load in N	50	100	150	200	250
Shear Load in N.	90	110	130	150	170

size of shear box 60 mm × 60 mm. Plot the failure envelope for the coil and find the value of angle of shearing resistance and cohesion.

b) In a constant head permeameter diameter of a soil sample was 4 cm and length was 14 cm under a constant head of 25 cm. The discharge was found to be 80 cc in 10 minutes. Calculate coefficient of permeability.

c) Give suitability of the following compacting equipments –

i) Dropping weight type vibrator roller

ii) Rubber or Pneumatic tyred roller

iii) Sheep foot roller

iv) Flat footed rammer

v) Vibratory plate compactor

vi) Grid roller.