17420

21718

3 Hours / 100 Marks Seat No. | | | | | | | | |

Instructions : (1) All Questions are *compulsory.*

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

(3) Preferably, write the answers in sequential order.

(4) Illustrate your answers with neat sketches wherever necessary.

(5) Figures to the right indicate full marks.

(6) Assume suitable data, if necessary.

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

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

Marks

1. (A) Attempt any SIX : **12**

(a) Define the following branches of Geology :

(i) Stratigraphy

(ii) Rock Mechanics

(b) Give the most common classification of the Metamorphic Rocks based on the basis of foliation.

(c) With a neat labelled sketch show any four elements of fold of rock.

(d) Define with neat labelled sketches the following :

(i) Asymmetrical Fold, (ii) Recumbent Fold.

(e) Draw three phase diagram for Dry Condition with neat labelled diagrams and explain all the notations used therein.

(f) Define (i) Denundation (ii) Deflation.

(g) State any four field applications of Geotechnical Engineering.

(h) Soil is called as three phase system, why ? Explain with a neat sketch with the meanings of all notations used therein.

(B) Attempt any TWO : **8**

(a) Draw neat labelled internal structure of Earth.

(b) State two types of folds and joints each and explain any one fold.

(c) State any four applications of soil as construction material and foundation bed.

2. Attempt any FOUR : **16**

(a) State any four effects of weathering on rocks.

(b) State particle size classification of soils.

(c) Describe Seismic Waves.

(d) State any four effects of earthquake.

(e) Explain any two types of weathering.

(f) Explain determination of dry density by core cutter method.

3. Attempt any FOUR : **16**

(a) Calculate the coefficient of Uniformity (Cu), and coefficient of curvature (Cc) for a soil sample for which,

(i) D_{10} = 0.0019 mm,

(ii) D_{30} = 0.030 mm,

(iii) D_{60} = 0.49 mm.

(b) State any four factors affecting the permeability of soil.

(c) In a falling head permeability test on a sample 12.2 cm length and 44.41 cm^2 in cross-sectional area, the water level in stand pipe of 6.25 mm internal diameter dropped from a height of 75 cm through 24.7 cm in 15 minutes. Find the coefficient of permeability.

(d) State any two advantages and disadvantages each of direct shear test of soil.

(e) State any four characteristics of flownet.

(f) Explain different types of earth pressure with the help of neat labelled sketches.

4. Attempt any FOUR : **16**

(a) State and explain factors affecting bearing capacity of soil. (any four)

(b) State any four assumptions made by Rankine's theory of earth pressure.

(c) Differentiate on any four points between compaction and consolidation.

(d) Explain standard Proctor test to obtain OMC and MDD values for given soil.

(e) Enlist methods of soil stabilization and shear, failure.

(f) Define CBR value and explain the test along with neat sketch.

5. Attempt any TWO : **16**

(a) Calculate void ratio, porosity and degree of saturation for soil mass of bulk density 1.76, specific gravity of soil grains 2.7 and water content as 30%.

(b) Draw neat labelled sketch to explain stepwise procedure to determine bulk density by sand replacement method.

(c) Explain Atterberg's limits of consistency and mechanical sieve analysis of soil.

P.T.O.

6. Attempt any TWO : **16**

(a) Write step by step procedure for determination of permeability of soil by falling head method permeability test. Explain with neat sketch.

(b) Explain with neat sketch plate load test as per IS 1888 by

(i) Gravity loading PLAN

(ii) Gravity loading SECTION

(iii) Graph to show limitations of plate load test. (any two)

(c) State any four equipments used for field compaction giving their suitability for different soils.
