17420

11718

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

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

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

(3) Illustrate your answers 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. (a) Attempt any SIX of the following : **12**

(i) State any four importance of geology.

(ii) Define dip and folds.

(iii) Define focus and epicenter.

(iv) State any four importance of soil in civil engineering.

(v) Define void ratio and porosity.

(vi) Define permeability and pheratic line.

(vii) Define safe bearing capacity and allowable bearing pressure.

(viii) State any two purpose of compaction.

(b) Attempt any TWO of the following : **8**

(i) State physical properties of minerals depending on light and state of aggregates.

(ii) List types of joints with sketches.

(iii) List any four field applications of geotechnical engineering.

2. Attempt any FOUR of the following : **16**

(a) Explain classification of rock based on mode of origin (genesis).

(b) Define fault and list its types.

(c) Give salient features of earthen dam in Maharashtra. (any two)

(d) Explain with sketch soil as a three phase system.

(e) Explain practical procedure of determining water content by oven drying method.

(f) List assumptions made by Terzaghi's analysis for soils bearing capacity.

3. Attempt any FOUR of the following : **16**

(a) State Information and classification of soils.

(b) State method of construction of earthquake resisting structure.

(c) Given D_{10} = 160 μ, D_{30} = 4.75 mm and D_{60} = 20 mm, find co-efficient of curvature of soil & co-efficient of uniformity.

(d) A saturated clayey soil weighing 1600 gms weighs 1200 gms after oven drying. If its dry density in 1350 kg/m^3, determine its water content, void ratio, porosity and degree of saturation.

Assume G = 2.50 and V_W = 12 KN/m^3.

(e) Explain with sketch plate load test.

(f) Define with sketch active and passive earth pressure.

4. Attempt any FOUR of the following : **16**

(a) Define dry unit weight and saturated unit weight with formulas.

(b) Explain with sketch specific gravity determination by pycnometer.

(c) In a falling head permeability test on a sample 15 cm high and 45 cm^2 in cross section area, the water level in stand pipe of 8 mm internal diameter dropped from a height of 75 cm to 25 cm in 15 minutes. Find the co-efficient of permeability.

(d) State factors affecting permeability.

(e) State any four factors affecting compaction with their effect.

(f) Differentiate between compaction and consolidation. (any four points)

5. Attempt any FOUR of the following : **16**

(a) Give classification of earthquakes based on focus and origin.

(b) Give any four causes and effects of earthquakes.

(c) Explain with sketch core cutter method test.

(d) Define liquid limit, plastic limit, shrinkage limit and plasticity index.

(e) Explain with sketch flow net.

(f) State any four field situations of shear failure.

6. Attempt any FOUR of the following : **16**

(a) Explain with sketch concept of zero air voids line.

(b) Give suitability of any four compaction equipments.

(c) State any four methods of soil stabilization and write procedure of any one.

(d) Give necessity of site investigation and sub-soil explorations.

(e) Explain with sketch Mohr – Coulomb failure theory.

(f) Explain with sketch mechanical sieve analysis.
