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Roll No. .....

4th Sem.
Branch : Civil
Sub. : Soil Mechanics and Foundation Engineering

Time : 3 Hrs. **M.M. : 60**

SECTION-A

Note: Multiple Choice Questions. All Questions are compulsory. (6x1=6)

Q.1 The representation of the three constituents of soil i.e., solid, water and air by the three spaces of diagram is called_____.

a) Bi-Phase diagram b) One phase diagram

c) Three phase diagram d) Two phase diagram

Q.2 The process of gradual reduction in the volume of soil mass under static loading is _____.

a) Compaction b) Consolidation

c) Compression d) None of these

Q.3 If the soil of expansive type, like in Black Cotton Soil, then the best foundation type is _____.

a) End bearing pile b) Batter pile

c) Friction pile d) Under-reamed pile

Q.4 Soils are basically _____.

a) Organic Materials b) Inorganic Materials

c) Minerals Materials

d) Organic & Inorganic Materials

Q.5 Effective stress is also known as _____.

a) Principal stress b) Pore pressure

c) Inter-granular stress d) None of these

Q.6 Talus is the soil transported by _____.

a) Wind b) Water

c) Glacial d) Gravitational force

SECTION-B

Note: Objective/Completion type questions. All questions are compulsory. (6x1=6)

Q.7 The numerical difference between the liquid limit and plastic limit of a soil is known as _____. (Plasticity Index / Pore water pressure)

Q.8 By_____ effective stress, quick sand conditions or piping can be prevented. (Increasing / Decreasing)

Q.9 The minimum water content at which soil just begins to crumble when rolled into 3mm diameter thread is _____ (Shrinkage limit / Plastic limit)

Q.10 To determine _____ the total load is divided by the safe bearing capacity of soil, (Width of foundation / Depth of foundation)

Q.11 If the hard rock strata is very great depth, then the feasible economical pile type is _____ (friction pile / end bearing pile)

Q.12 Clay can be classified as _____ (Highly cohesive soil / Limited cohesive soil)

SECTION-C

Note: Short answer type Questions. Attempt any eight questions out of ten Questions. (8x4=32)

Q.13 Describe the various engineering properties of "Black Cotton soils".

Q.14 Explain the different causes of settlements in soils.

Q.15 `Describe the importance of "Geo-synthetics" in the improvement of bearing capacity of soils.

Q.16 With the help of phase diagram state following terms.

a) Void Ratio b) Degree of saturation

Q.17 Write a short note on location of bore holes for a project.

Q.18 Enlist any five factors affecting the permeability of soils.

Q.19 Determine the water content, void ratio and porosity of soil sample of saturated clay from a consolidometer test having a total mass of 1.562 kg and a dry mass of 1.035kg. The specific gravity of the solid particle is 2.69.

Q.20 Write a short note on "Freezing and Thawing of Soils".

Q.21 Write the different classification of piles and describe any two of them with the help of diagram.

Q.22 Explain any four comparison between effective stress and neutral stress in soils.

SECTION-D

Note: Long answer questions. Attempt any two questions out of three Questions. (2x8=16)

Q.23 a) Calculate the coefficient of permeability of a soil sample, 6 cm in height and 60cm^2 in cross-sectional area, if a quantity of water equal to 500ml passed down in 8 min, under an effective constant head of 30cm.

b) Describe the engineering applications of particle size distribution curve for soils.

Q.24 a) Describe the various factors on which depth and location of foundation depend.

b) Describe the process of soil exploration using "Percussion Boring method".

Q.25 a) Describe the process of determining the shear strength of soil using direct shear test apparatus.

b) Enlist the various methods of compaction of soil in the field and describe any one of them.