Roll no._____ **ID: 180745**

Semester: 4th

Branch: Civil Engg.

Subject Name: Soil Mechanics and Foundation Engineering

Time Allowed : 3 Hrs. **MM:100**

Section –A

Note: Multiple Choice questions. All questions are compulsory. **10x1=10**

Q.1 The term soil compaction refers to:
a) The process of adding water to the soil
b) The process of increasing the density of the soil
c) The process of reducing the density of the soil
d) The process of adding air to the soil

Q.2 The unit weight of soil is defined as:
a) The weight of the soil per unit volume
b) The weight of the soil per unit area
c) The weight of the soil per unit length
d) The weight of the soil per unit thickness

Q.3 The term "effective stress" refers to:
a) The total stress acting on the soil
b) The stress caused by the weight of the soil
c) The stress caused by the water in the soil
d) The stress caused by the soil particles on each other

Q.4 The bearing capacity of a soil is defined as:
a) The ability of the soil to support loads without excessive settlement
b) The ability of the soil to resist shear forces
c) The ability of the soil to transmit water
d) The ability of the soil to withstand tensile forces

Q.5 The term "consolidation" refers to:
a) The process of adding water to the soil
b) The process of reducing the density of the soil
c) The process of increasing the density of the soil
d) The process of settling of the soil over time

Q.6 The standard penetration test (SPT) is used to determine:
a) The shear strength of the soil
b) The compressibility of the soil
c) The permeability of the soil
d) The density of the soil

Q.7 TheTriaxial compression test is used to determine:
a) The shear strength of the soil
b) The compressibility of the soil
c) The permeability of the soil
d) The density of the soil

Q.8 The undrained shear strength of a soil is typically measured:
a) In a direct shear test
b) In a triaxial compression test
c) In a consolidation test
d) In a permeability test

Q.9 The OMC (Optimum Moisture Content) of a soil is:
a) The moisture content at which the soil has the maximum shear strength
b) The moisture content at which the soil has the minimum shear strength
c) The moisture content at which the soil has the maximum density
d) The moisture content at which the soil has the minimum density

Q10 What is the bearing capacity of a soil?
a) The maximum load that can be applied to a soil without causing it to fail.

b) The maximum shear stress that a soil can withstand.
c) The maximum tensile stress that a soil can withstand.
d) The maximum compressive stress that a soil can withstand.

Section-B

Note: Objective type questions. All questions are compulsory. 10x1=10

Q.11 The term used to describe the force per unit area acting on a plane within a soil mass is _____.
Q.12 In the soil classification system, the abbreviation "CL" stands for _____.
Q.13 A soil's capacity to bear a load without excessive settlement is known as its _____.
Q.14 The process by which soil particles settle and the void space decreases is called _____.
Q.15 The weight of water contained in a soil is known as its _____.
Q.16 The shear strength of a soil is directly proportional to its effective stress. (True/ False)
Q.17 A cohesive soil has a high permeability. (True/ False)
Q.18 A soil's shear strength is independent of its particle size distribution. (True/ False)
Q.19 Define Phase Diagram of Soil.
Q.20 Define Footing .

Section –C

Note: Short answer type Questions. Attempt any twelve questions out of fifteen questions. 12x5=60

Q.21 Explain different type of earth pressure.
Q.22 Define the relative density, What is its practical utility?
Q.23 Explain the different types of soil and their characteristics.
Q.24 What is Plastic Limit of Soil and how it is measured?
Q.25 Soil is three phase system, define the conditions when it is converted to two phase system.
Q.26 What do you mean by permeability and what are the methods to measure the permeability of Soil?
Q.27 What is the difference between Compaction and Consolidation?
Q.28 What is Standard Penetration test and How it is done?
Q.29 What do you mean Shear Strength of Soiland what are different methods to measure the Shear Strength of Soil?
Q.30 Define Coulombs law showing diagrammatic representation for all types of Soil.
Q.31 Explain OMC, MDD, Zero air void line with the help of compaction curve.
Q.32 What is Plate Load Test? What are the limitations of it?
Q.33 What is Recovery Ratio? Give its Significance.
Q.34 Give the classifications of pile according to materials and composition.
Q.35 What is well foundation? Give its necessity

Section-D

Note: Long answer type questions. Attempt any two questions out of three questions. 2x10=20

Q.36 a) What are the different methods of soil exploration? Describe the advantages and disadvantages of each method.
b) Define area ratio, inside clearance and outside clearance.
Q.37 Describe any 5 different laboratory tests used in soil mechanics and their significance.
Q.38 a) Explain the significance of soil settlement in foundation engineering. Describe the different types of soil settlement and their causes.
b) Describe the different types of shallow foundations and their advantages and disadvantages.