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Civil , Constr. Mgmt., Civil Engg (Spl Highway Engg)
Subject:- Soil Mechanics and Foundation Engineering
/ Soil & Foundation Engg.

Time : 3Hrs.

M.M. : 100

SECTION-A

Note: Multiple choice questions. All questions are compulsory (10x1=10)

Q.1 The soil transported by wind is called (CO1)

- a) Aeoline soil c) Alluvial soil
- b) Marine soil d) Lacustrine soil

Q.2 Void ratio of soil is the ratio of the: (CO2)

- a) Volume of voids to volume of soil solids
- b) Volume of voids to volume of soil water
- c) Volume of soil solids to volume of voids
- d) Volume of voids to total volume

Q.3 The soil having 50% particle size (by weight) smaller than 75 micron is known as (CO2)

- a) Cohesion less soil b) Both A and B
- c) Cohesive soil d) None of these

Q.4 Which is more suitable for the determination of permeability of sandy soil? (CO4)

- a) Constant head method
- b) Horizontal permeability test
- c) Variable head method
- d) Hydrometer method

Q.5 Neutral stress is refers to (CO5)

- a) Submerged weight of soil
- b) Saturated weight of soil
- c) Pore water pressure
- d) Minor principal stress

Q.6 Consolidation is a process involving (CO6)

- a) Sudden compression of soil
- b) Gradual expulsion of pore water
- c) Tilting and failure of structure
- d) None of these

Q.7 Shearing strength of a cohesion less soil depends upon (CO7)

- a) Dry density b) Loading rate
- c) Void ratio d) Normal stress

Q.8 The process of gradual reduction in the volume of soil mass under dynamic loading is (CO8)

- a) Compaction b) Cohesion
- c) Consolidation d) None of these

Q.9 The rammer used in light standard proctor test is of weight (CO8)

- a) 4.8 kg b) 2.6 kg
- c) 2 kg d) 5 kg

Q.10 The pile having one or more bulbs for resisting lateral loads is called (CO11)

- a) Fender pile b) Tension pile
- c) Batter pile d) Under-reamed pile

SECTION-B

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

- Q.11 The water which cannot be removed by oven drying at 110° C is _____ (CO2)
Q.12 Define degree of saturation. (CO2)
Q.13 Define Coefficient of uniformity. (CO3)
Q.14 Define Darcy's law. (CO4)
Q.15 When the aquifer is present between two aquiclude, it is known as _____. (CO4)
Q.16 Define Effective stress. (CO5)
Q.17 Define Compression Index. (CO6)
Q.18 Define over-consolidation soil. (CO6)
Q.19 Define shear strength of soil. (CO7)
Q.20 Define Optimum water content. (CO8)

SECTION-C

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

- Q.21 What are the major soil deposits of India? (CO1)
Q.22 An unsaturated 100 cm³ sample of soil weight 300g, if its dried weight is 280g, calculate its water content. (CO2)
Q.23 What are the characteristics feature of particle size distribution curve? (CO3)
Q.24 Enlist any five factor which affect permeability of soil. (CO4)
Q.25 Explain the concept of effective stress. (CO5)
Q.26 Define consolidation and its types. (CO6)

- Q.27 Enlist three advantage and disadvantages of direct shear test? (CO7)
Q.28 Differentiate compaction and consolidation. (CO8)
Q.29 Explain plate load test. (CO9)
Q.30 Define isobar and pressure bulb with sketch. (CO9)
Q.31 Define ultimate bearing capacity, net ultimate bearing capacity and net safe bearing capacity. (CO9)
Q.32 Name the method of solid exploration. Explain any one in detail. (CO10)
Q.33 Explain rotary boring. (CO11)
Q.34 Enlist the factors affecting the depth of shallow foundation. (CO11)
Q.35 What is deep foundation? Write its types and explain any one in detail. (CO11)

SECTION-D

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

- Q.36 a) Find the shear strength of the soil with stress parameters $c = 60 \text{ KN/m}^2$ and $\phi = 16^\circ$. The normal stress on soil is 90 Kn/m^2 .
b) Define Coulomb's law showing diagrammatic representation for c-soil, ϕ -soil and c- ϕ soil. (CO7)
Q.37 What are the different methods of soil exploration? Explain the excavation of trail pits for collection of samples. (CO9)
Q.38 Explain Well foundation, also explain components of well foundation with neat sketch. (CO11)
(Note: Course outcome/CO is for office use only)