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Roll No. .....

5th Sem / Branch : Civil Engineering/Constr. Mgmt. Civil Engg. (Spl. Highway)
Sub. : Soil Mechanics & Foundation Engineering/ Soil & Found Engg.

Time : 3Hrs. M.M. : 100

SECTION-A

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

Q.1 Which of the following is cohesive soil
a) Kankar b) Loose coarse sand
c) Black cotton soil d) Sand with clay

Q.2 Relationship between natural void ratio 'e" and porosity 'n' is
a) $n = e(1+e)$ b) $e = n(1+n)$
c) $e = n(1+e)$ d) $n = e(1+n)$

Q.3 Minimum size of silt particles is _____
a) 0.002 mm b) 0.04 mm
c) 0.06 mm d) 0.001 mm

Q.4 The factor which does not affect permeability is
a) Void ratio b) Particle size
c) Moisture content d) Shape of particles

Q.5 The possibility of quick sand condition will be there when flow of water to soil is
a) Horizontal b) Upwards
c) Downwards d) Radial

Q.6 Square root of time fitting method is used for calculating

a) Compression index
b) Co-eff. of consolidation
c) Co -eff. of compressibility
d) Co -eff. of volume change

Q.7 An angle of internal friction
a) Varies with density of sand
b) Varies with normal direct pressure
c) Depends upon the amount of interlocking
d) All of the above

Q.8 Auger may be
a) Post hole type b) Screw type
c) Shell type d) All of the above

Q.9 Which of the following is not the element of well foundation?
a) Driving shoe b) Curb
c) Steining d) Bottom plug

Q.10 Pile foundations are suitable for
a) Small loads
b) Load bearing walls
c) Transferring load to firm strata
d) Transferring load in clays

SECTION-B

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

Q.11 The soil transported by wind is called _____.

Q.12 Porosity is also known as _____.

Q.13 Uniformity co-efficient is the ratio of _____.

Q.14 Darcy's law is valid for _____ type of flow.

Q.15 The neutral stress on the soil due to the _____.

Q.16 Creep occur more in _____ soil.

Q.17 Vane shear test cannot be performed in the field. (True/False)

Q.18 The dry density unit weight γ_d is computed by _____.

Q.19 Raft footing is a deep foundation. (Trye/False)

Q.20 Define well cap.

SECTION-C

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

Q.21 Explain engineering classification of soils.

Q.22 A soil has a bulk density of 2.0 g/cc and water content of 18%. Calculate the water content if the soil partially dries to a density of 1.95 g/cm^3 and the void ratio remains unchanged.

Q.23 A soil sample has a void ratio of 0.8 and specific gravity of solid particles 2.67. If the moisture content cannot be determined., then can you find the upper and lower limits? If yes find them.

Q.24 Briefly explain the Atterberg's limits.

Q.25 What is seepage velocity how seepage velocity , v_s is related to velocity of flow, v?

Q.26 Explain the concept of effective stress.

Q.27 Explain settlement and its types.

Q.28 What are the drainage conditions for performing the shear tests?

Q.29 Differentiate between compaction & consolidation.

Q.30 Write a short note on O.M.C.. Explain compaction curve.

Q.31 What are the limitations of plate load test?

Q.32 Explain Area ratio & Recover ratio of samples and its significance.

Q.33 What are the factors affecting the depth of shallow foundations.

Q.34 How would you improve bearing capacity of soils?

Q.35 Define

a) bearing capacity
b) Ultimate bearing capacity
c) Net safe bearing capacity
d) Pressure bulb

SECTION-D

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

Q.36 a) Explain the different types of shallow foundations used in practice.

b) Define well foundation. What are the important elements of well foundation. Explain with a neat sketch of a typical well.

Q.37 Why soil exploration is necessary? Explain the factors that you will consider while planning soil exploration. Also write key points regarding spacing & depth of bore holes, location of boring.

Q.38 a) Give concept of shear strength

b) Explain direct shear test for determining the shear strength of cohesionless soils in the laboratory.