No. of Printed Pages : 4 180745
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4th Sem. / Civil
Subject : Soil Mechanics and Foundation Engineering

Time : 3 Hrs. M.M. : 100

Section-A

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

Q.1 Loess is silty clay formed by the action of
a) Water b) Glacier
c) Wind d) Gravitational force

Q.2 Relationship between void ratio 'e' and porosity 'n' is
a) n=e/(1+e) b) e=n/(1+n)
c) e=n(1+e) d) None

Q.3 Maximum size of clay particle is
a) 0.002 mm b) 0.04 mm
c) 0.06 mm d) 0.001 mm

Q.4 Falling head permeability test is preferable when soil sample is
a) Sandy b) clayey
c) Silty sand d) Sandy gravel

Q5. Neutral stress refers to
a) Submerged weight of soil
b) Minor principle stress
c) Saturated weight of soil
d) Pore water pressure

Q.6 Consolidation theory was given by
a) Skempton b) Terzaghi
c) Rankine d) Westergaard

Q.7 Unconfined compression test is generally done on saturated clay for which angle of shearing resistance is
a) Zero b) 15^{o}
c) 30^{o} d) None

Q.8 In modified proctor test, the weight of rammer is
a) 3.0 kg b) 2.0 kg
c) 2.6 Kg d) 4.89 Kg

Q.9 In SPT test, the number of blows is counted corresponding to penetration of sampler for distance of
a) 15 cm b) 30 cm
c) 45 cm d) 50 cm

Q.10 Which type of sample is not generally collected in soil excavation?
a) Block b) Cylindrical
c) Circular d) All of these

SECTION-B

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

Q.11 The black cotton soil is an example of _____ soil.

Q.12 For fully saturated soil, volume of S is _____.

Q.13 Particle size analysis is also known as _____.

Q.14 The impervious soil deposit containing water are ____.

Q.15 The stresses which develop is the sub-soil below W.T. are _____ and. _____.

Q.16 Due to lowering of water table, settlement increases. (True/False)

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

Q.18 At O.M.C. The minimum compaction is obtained. (True/False)

Q.19 Grouting technique is used for clay. (True/False)

Q.20 General exploration is a shallow exploration. (True/False)

Section-C

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

Q.21 Enlist any three Differentiate between a) Soil mechanics and soil engineering b) delta and dune.

Q.22 With standard notation prove that $Y_d = Y/1+w$ where Y-Unit weight of soil, w-water content.

Q.23 An unsaturated 100 cm^3 sample of soil weight 190 g. If the dried weight is 160g. Calculates its water content.

Q.24 How will you determine liquid limit of a given soil sample in the laboratory?

Q25 Define coefficient of permeability. What are its limitations?

Q.26 Constant head permeability test was carried out on cylindrical sample of sand 10 cm diameter and 15cm height. 160 cm^3 of water was collected in 1.75 minutes under a head of 30cm. Compute the coefficient of permeability and velocity of flow.

Q.27 Explain the role of voids in pore water pressure.

Q.28 Define compression Index, coefficient of consolidation and degree of consolidation.

Q.29 What are the drainage conditions for performing the sheartest?

Q.30 Differentiate between compaction and consolidation.

Q.31 When the degree of consolidation in 50%. What will be the time factor (T_v).

Q.32 Explain the plate load test to find out ultimate bearing capacity of soil.

Q.33 What is significance of recovery ratio?

Q.34 Give the concept of shallow and deep foundation.

Q.35 Write short note on tilt and shifts.

SECTION-D

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

Q.36 What is density control? Explain the method for measurement of field density during compaction.

Q.37 Describe the settlement and its types and different causes of settlement.

Q.38 What do you understand by shear strength of soil? Explain types of shear failure through examples.