

Printed Pages :3



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NAG-403

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 180418

Roll No.

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B.Tech. (Semester-IV)

SPL. THEORY EXAMINATION, 2014-15

SOIL MECHANICS

Time : 3 Hours]

[Total Marks : 100

Note: Attempt all questions.

Q.1. Attempt any four parts of the following:

(5×4=20)

(a) Prove that $\gamma_d = (1 - n) G\gamma_w$

(b) Explain various type of soil structure.

(c) Write down short notes on:

(i) Compaction

(ii) Density index

(b) Discuss the major benefits from the use of sand drain.

(c) Explain Terzaghi's theory of consolidation giving the assumptions made.

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(1)

[Contd...

Q.2. Attempt any four parts of the following: (5×4=20)

- Explain the principles of consolidation.
- Explain the significance of consistency limits and indices.
- Explain a method to determine the value of coefficient of volume compressibility m_v and coefficient of compression index C_c through one dimensional test.
- Explain logarithmic time fitting method to determine the coefficient of consolidation.
- Derive the following formula.
eSr = wG symbols have usual meaning.
- Explain a test procedure to determine the hydraulic conductivity coefficient of a clay soil.

Q.3 Attempt any two parts of the following: (10×2=20)

- Explain standard proctor compaction test. How will you plot zero air void line?
- With the help of sketches, explain the unconfined compression test for determining shearing resistance of soil.
- Compute the intensities of active and passive earth pressure at depth of 8 meters in dry cohesionless sand with an angle of internal friction of 30° and unit weight of 18 kN/m^3 . What will be intensities of active and passive earth pressure if the water level rises to the ground level? Take saturated unit weight of sand as 22 kN/m^3 .

Q.4. Attempt any two parts of the following: (10×2=20)

- A direct shear test is run on medium sand under the normal stress of 50 kPa. The maximum shear stress at failure is measured as 30 kPa. Draw the Mohr's circle at failure and determine the magnitude of principal stresses in the failure zone. What is the orientation to the plane of maximum shear stress at failure?
- Explain Mohr's shear strength theory and Mohr circle of stress. What is the importance of pole?
- Derive the basic differential equation of consolidation for finding the relation between hydrostatic pressure and expulsion of excess pore water?

Q.5. Attempt any two parts of the following: (10×2=20)

- Why land slid occurs? Explain the friction circle method to evaluate the stability of slope.
- Prove that in stratified soil deposit, coefficient of hydraulic permeability in horizontal direction is greater than that of in vertical direction?
- Explain Liquid limit, Plastic limit and Shrinkage limit using the consistency index curve.

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