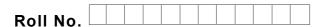
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M.Tech.(Geo Technical Engineering)/(Soil mechanics & foundation engineering) (2013 & Onwards) (Sem.–1)

ANALYSIS OF SETTLEMENTS OF SOIL AND FOUNDATION Subject Code : CESE-5 Paper ID : [E1002]

Time: 3 Hrs.

Max. Marks: 100

INSTRUCTIONS TO CANDIDATES :

- 1. Attempt any FIVE questions out of EIGHT questions.
- 2. Each question carries TWENTY marks.
- 3. Assume missing data suitably.
- Q1. a) A sample is subjected to uniaxial loading. Deduce the expression for (i) volumetric strain (ii) maximum shear strain. (6)
 - b) Define Rod velocity, Shear velocity and Dilatational velocity. (6)
 - c) "The shear modulus of soil finds its widest use in connection with foundation vibration problems and is generally evaluated through measurement of shear wave velocity". Discuss in detail.
 (8)
- Q2. a) You are interested to determine Poisson's Ratio for a soil specimen. Which test you will perform to compute the value? Explain the procedure in detail. (10)
 - b) List the various assumptions made in Terzaghi's 3-Dimensionat Consolidation equation.
- Q3. a) Define critical void ratio and explain its significance.
 - b) The consolidation settlement of a new structure founded on a 5 m thick layer is estimated as 75 mm. The structure was found to have settled by 30 mm in 8 months after the completion of construction. If the clay layer is underlain by rock and overlaid by a layer of coarse sand, determine (i) time required for 50% consolidation to occur, (ii) The amount of settlement which will take place in next 10 months. (13)
- Q4. a) How would you determine the settlement of a pile group in cohesion-less soil? (10)
 - b) Write any two empirical formulae for estimating the efficiency of a pile group. (10)
- Q5. a) What are sand drains? How these are installed in the field? Explain the functions of sand drains. (12)

(10)

(7)

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- b) What is Negative skin friction? Explain its significance. (8)
- Q6. What is mat foundation? Discuss circumstances, under which mat foundation is resorted to. Discuss codal recommendations and design details of a Mat Foundation. (20)
- Q7. Foundation of a bridge is to be designed. Describe about the loads for which you, as a Geotechnical engineer, will design the foundation? (20)
- Q8. Write short notes on :
 - a) Under-reamed pile foundation. (10)
 - b) Skempton-Bjerrum's Theory. (10)

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