NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF CIVIL AND WATER ENGINEERING
FACULTY OF INDUSTRIAL TECHNOLOGY
BACHELOR OF ENGINEERING (HONOURS) DEGREE
PART V SECOND SEMESTER EXAMINATION- MAY 2014

GEOTECHNICAL ENGINEERING - II – TCW 5103

INSTRUCTIONS

Answer All Questions   **Time: 3 Hours**
Open Book Examination   **Total Marks 100**

QUESTION ONE

Design a rectangular base to support two columns carrying the following
characteristic loads:
Column 1   Dead load 310kN; imposedload 160kN
Column 2   Dead load 430kN; imposedload 220kN
The columns are 350mm square and are spaced at 3.5meters. The safe
bearing pressure is 200kN/m^2.
The materials are grade 30 concrete and grade 460 reinforcement
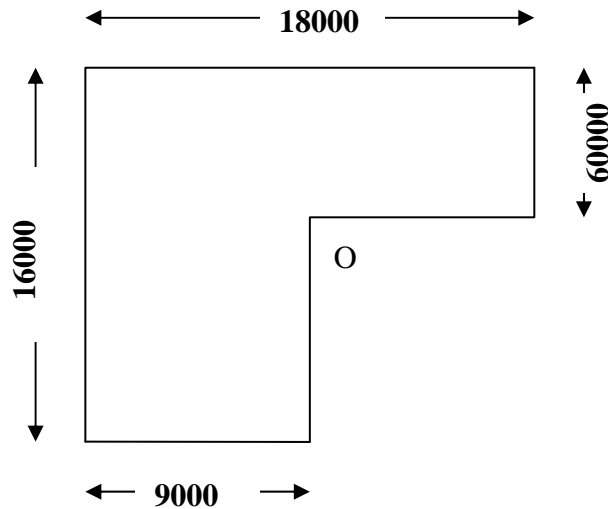
40 Marks

QUESTION TWO

(**A**) What are the assumptions made in Boussinesq's formulas for
stress distribution in soils.

5 **Marks**

(**B**) A raft foundation of the dimension shown in the figure carries a
uniformly distributed load of 300 kN/m^2 . Estimatethe vertical
pressure at a depth of 9meters below the point **O** marked in the
figure.
20 Marks

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QUESTION THREE

A group of nine piles, 10 meter long is used as a foundation for
a bridge pier. The piles are 300mm diameter with center to center
spacing of 900mm. The sub soil consist of clay with unconfined
strength of 150 kN/m^2. Determine the efficiency of the pile group.

20 Marks

QUESTION FOUR

(a) Explain the following
(i) Immediate settlement
(ii) Consolidation settlement
(iii) Final settlement

10 Marks

(b) Describe the causes of differential movement between parts of a
structure

5 Marks