TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

CONSTRUCTION TECHNICIAN PART II

EBC 1305: COLUMNS STRUTS & COMBINED STRESSES

END OF SEMESTER EXAMINATION
SERIES: APRIL 2013
TIME ALLOWED: 2 HOURS

<u>**Instructions to Candidates:**</u>
You should have the following for this examination
- *Answer Booklet*
This paper consists of **FIVE** questions.

Answer any **THREE** questions
Maximum marks for each part of a question are as shown
This paper consists of **THREE** printed pages
Question One

a) Distinguish between axial force and eccentric force.

b) Determine the actual combined stresses at points A and B in figure 1   **(20 marks)**

       $I_{xx} = 29914$ cm^4
      $I_{yy} = 9796$cm^4
      $A = 212.4$cm^2

Question Two

Determine the combined stresses at point A and B.   **(20 marks)**

$I_{xx} = 29914\text{cm}^4$
$I_{yy} = 9796\text{cm}^4$
$A = 212.4\text{cm}^2$

Question Three

a) Define the following applied struts.
   (i) Actual length
   (ii) Effective length
   (iii) Slenderness ratio

b) Illustrate diagrammatically all condition of Euler load. **(20 marks)**

Question Four

A column of Actual length 4.0m is fully fixed at both ends. The size of the column is 250mm x 250mm. Determine the safe Euler load. **(20 marks)**

Question Five

Illustrate diagrammatically on condition of end restraint of members in compression. **(20 marks)**