TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

CERTIFICATE IN BUILDING & CIVIL ENGINEERING (12S)

EBC 1305: COLUMNS, STRUTS & COMBINED STRESSES

END OF SEMESTER EXAMINATION
SERIES: OCTOBER/NOVEMBER 2013
TIME ALLOWED: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*
- *Scientific Calculator*

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)**

X

Question Two

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

A

Question Three

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

b) Illustrate diagrammatically all conditions 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. By use Euler's equation solve the safe load **(20 marks)**

Question Five

Illustrate diagrammatically FIVE condition of end restraint of member in comparison **(20 marks)**