TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

DIPLOMA IN BUILDING & CIVIL ENGINEERING (DBCE 13S)

EBC 2203: STRENGTH OF MATERIALS I

END OF SEMESTER EXAMINATION
SERIES: APRIL 2015
TIME ALLOWED: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions. Answer any **THREE** questions of the **FIVE** questions
Maximum marks for each part of a question are as shown
Use neat, large and well labeled diagrams where required

This paper consists of **THREE** printed pages

Question One

a) Define the following as applied to load beams:
   (i) Shear force at a point
   (ii) Bending moment at a point **(5 marks)**

b) Sketch shear force and bending moment diagrams for the beam loaded in figure 1 **(15 marks)**

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Question Two

Determine I_{xx}, I_{yy} and Z_{xx} for the section in figure 2 **(20 marks)**

25mm

Question Three

a) Illustrate diagrammatically a tensile test on mild steel loaded to destruction **(5 marks)**

b) The following results were obtained a tensile on mild steel.
   - Diameter of specimen = 20mm
   - Elongation after 25KN load = 0.06mm
   - Load at yield point = 25KN
   - Reduction of area at failure = 4.0mm2
   - Load at failure = 15KN

Determine:

(i) Esteel
(ii) Yield stress
(iii) Ultimate stress **(15 marks)**

Question Four

a) Define the following as applied to trusses **(5 marks)**
   (i) Ties
   (ii) Struts

b) Determine the nature and magnitude of the member forces of the frame in figure 3 **(15 marks)**

30^{o}

Question Five

Sketch shear force and bending moment diagrams in figure 4 and indicate values at the critical points **(20 marks)**

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