



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

DIPLOMA IN BUILDING AND CIVIL ENGINEERING

EBC 2203: STRENGTH OF MATERIAL I

END OF SEMESTER EXAMINATION

SERIES: APRIL 2016

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination

- Answer booklet
- Calculator

This paper consists of **FIVE** questions

Answer any other **THREE** questions

Maximum marks for each part of a question are as shown

This paper consists of **THREE** printed papers.



QUESTION ONE

From the first principal describe the

- i) Stress- strain curve (8marks)

- ii) A short timber post of rectangular section has one side of its section twice the other when the post is loaded axially with 8.8Kn it contract 0.119 mm/m of length if E of timber =84KN/mm² calculate the sectional dimension of the post. (12marks)

QUESTION TWO

- a) Define the following terms
 - i. Shear force
 - ii. Bending moment (2marks)

- b) A cantilever beam 1.5m long is carrying point loads of 1000kg each at distances of 0.5m 1.0m and 1.5m from the fixed end draw the shear force and bending moment diagram for cantilever beam. (18 marks)

QUESTION THREE

A cantilever beam 2m long carries a uniformly distributed load of 1000kg per meter on a span of 1m at a distance of 0.5m from the free ends. The beam itself weights is 200kg/m run construct the shear force and bending moment diagram for cantilever beam.

(20marks)

QUESTION FOUR

- a) Describe the determination of center of gravity by the method of moment (6marks)
- b) Distinguish between center of gravity and centroid (2marks)
- c) A metal bar 50mm by 50mm section is subjected to an axial compressing load of 500KN the contraction of 200mm gauge length is found to be 0.5mm and the increase in thickness is found to be 0.04m find the value of
 - i. Young modulus
 - ii. Poisons ration [12 marks]



QUESTION FIVE

The figure below shows a bridge truss fixed at one end and pinned at the other analyses the frame using the method of joint resolution. **(20 marks)**

