



TECHNICAL UNIVERSITY OF MOMBASA

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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

Use neat, large and well labelled diagrams where required

Maximum marks for each part of a question are as shown

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



### QUESTION ONE

a. Defined the following terms

- i. Working stress
- ii. Tangent modulus
- iii. Strain hardening

(6marks)

b. With an aid of a diagram illustration the stress/stain relationship

(8marks)

c. A bar of sectional area  $1250\text{mm}^2$  and  $2.0\text{m}$  length extend to  $0.4\text{mm}$  when an axial load of  $52.5\text{KN}$  was applied calculate the young modulus for the material.

(6marks)

### QUESTION TWO

A specimen has an initial gauge length of  $55\text{mm}$  and X area of  $150\text{mm}^2$

Load KN	0	10	20	30	35	38	40
Extension mm	0	0.075	0.15	0.23	0.30	0.38	0.6

A test of the specimen gave the above result.

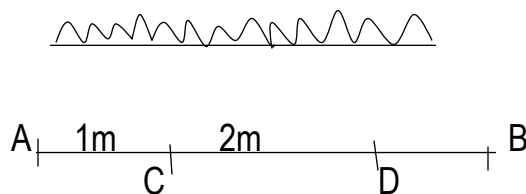
a) Draw the stress strain curve and determine

- i. Modular of elasticity
- ii. Ultimate stress
- iii. Breaking strength

(20marks)

### QUESTION THREE

Draw the shear force and bending moment diagram for a simple supported beam loaded as shown.

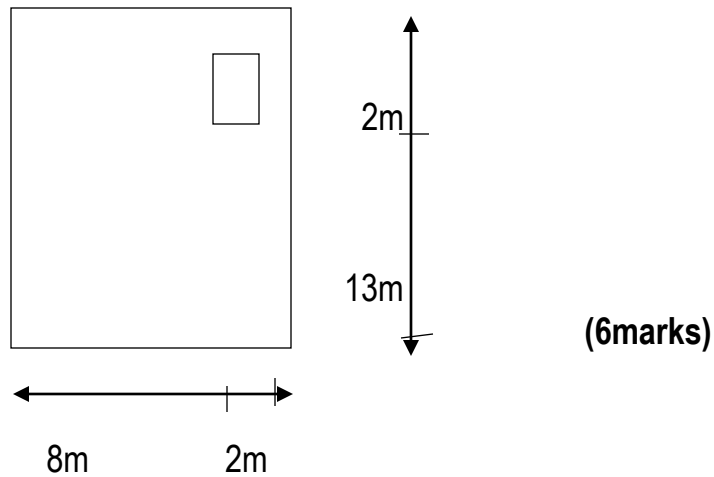


(20marks)



#### QUESTION FOUR

- i) Determine the center of gravity of the figure below



- ii) From first principal show how to determine the center of gravity by method of moment. (10marks)
- iii) Distinguish between centroid and center of gravity. (4marks)

#### QUESTION FIVE

Using method of section analyze the truss below (20 marks)

