



TECHNICAL UNIVERSITY OF MOMBASA
**Faculty of Engineering &
Technology**

DEPARTMENT OF BUILDING & CIVIL ENGINEERING
DIPLOMA IN BUILDING & CIVIL ENGINEERING (DBCE 13J)

EBC 2302: THEORY OF STRUCTURES III

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2014

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

All questions carry equal marks

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

Using the three moment theorem, analyze the beam shown in figure 1 below and sketch the bending moment of shear force diagram indicating the values at all critical points. **(20 marks)**

A

Question Two

Using the three moment theorem, analyze the loaded beam shown in figure 2 below, sketch the BM and SI diagram indicating values at all critical points. **(20 marks)**

D

Question Three

Using the moment distribution method, analyze the beam in figure 3 below and draw the bending moment diagram. **(20 marks)**

D

Question Four

Using the method of moment distribution, analyze the frame in figure 4 below and draw the bending moment diagram indicating all critical values. **(20 marks)**

6m

Question Five

- a) Define influence lines. **(5 marks)**
- b) Two rolling loads, 5KN and 4KN spaced 2m apart moves along a girder 10m span.
- (i) Determine the maximum reaction at any support if any of the wheels leads
 - (ii) Determine the maximum reaction at any support if either of the loads is at the centre of the girder.
 - (iii) Determine the maximum positive and negative shear force at a section 4m from the left and if any load takes the lead. **(15 marks)**