



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

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR DECREE IN:

BACHELOR OF SCIENCE IN CIVIL ENGINEERING (BSCE)

ECE 2318: THEORY OF STRUCTURES

END OF SEMESTER EXAMINATION

SERIES: APRIL 2015

TIME ALLOWED: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*
- *Programmable Calculator*

This paper consists of **FIVE** questions. Answer question **ONE (COMPULSORY)** and any other **TWO** 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 (Compulsory)

- a) The following methods are applied to assess the moment distribution in structural elements. Compare their mode of application-slope deflection method vs moment distribution method.
- b) The **FOUR** fixture members in figure 1 are connected at joint O. Their section properties are given. Find the moments induced in each end of each beam if the external moment in 12kNm acts on the joint.

Member	Length (m)	I (mm⁴)	
AO =	4	3 x 10 ⁸	
BO =	3	2 x 10 ⁸	
CO =	5	5 x 10 ⁸	
DO =	6	6 x 10 ⁸	(10 marks)

- c) Using slope deflection methods analyze the simple frame shown in figure 1(b) below. (BMD & SFD not required) **(15 marks)**

Question Two

- a) Discuss the purpose of analyzing moment distribution **(4 marks)**
- b) Using the slope deflection method analyze the portal frame in figure 2 **(16 marks)**

Question Three

- Using moment distribution method analyze the beam in figure 3 **(20 marks)**

Question Four

Analyze the portal frame having different height column in figure 4 below

(20 marks)

Question Five

In figures 5(i) and (ii) determine only the FEM and rotation equations

(20 marks)