TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

DIPLOMA IN BUILDING & CIVIL ENGINEERING (DBCE 12M)

EBC 2301: THEORY OF STRUCTURES III

END OF SEMESTER EXAMINATION
SERIES: APRIL 2014
TIME ALLOWED: 2 HOURS

Instructions to Candidates:
You should have the following for this examination

- *Answer booklet*
- *Scientific Calculator*
- *Mathematical Tables*

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
This paper consists of **THREE** printed pages

Question One

Using the method of moment distribution analyze the beam shown in figure 1 and sketch the shear force and bending moment diagrams indicating the critical values. **(20 marks)**

3I

Question Two

Using the three moment theorem analyze the beam of uniform cross-section shown in figure 2 and sketch the shear force and bending moment diagrams indicating the critical values. **(20 marks)**

D

Question Three

Figure 3 show a portal frame, fixed at A and D, and having rigid joints at B and C.

a) Using the method of moment distribution and carrying out five distribution only, analyze the frame and determine the reactions at A and D. **(10 marks)**

b) Sketch the bending moment diagram and the deflected shape of the frame in figure 3. **(10 marks)**

2m

Question Four

Figure 4 shows a continuous beam which is encastre at D.

a) Using the three moment theorem, analyze the beam and sketch the bending moment diagram, indicating all critical values. **(15 marks)**

b) Determine the values of the reactions. **(5 marks)**

6m

Question Five

Analyze the portal frame shown in figure 5 – using moment distribution (4 distribution)

(20 marks)

I_{ab}: I_{bc}: I_{cd} = 1: 2: 1