MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)
University Examinations for 2015/2016

SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

FIRST SEMESTER EXAMINATION FOR
DIPLOMA IN BUILDING CONSTRUCTION AND TECHNOLOGY
DIPLOMA IN CIVIL ENGINEERING

BCECD 302: THEORY OF STRUCTURES III
BCE BD 302: THEORY OF STRUCTURES III

Date: 2/8/2016   **Time: 2:00 – 4:00 PM**

INSTRUCTIONS:

- *This paper comprises of five questions*
- *Question one is compulsory and carry 30 marks*
- *Answer question one and any other two questions*
- *No mobile phones are allowed in the exam room*

1   A continuous beam ABCD is simply supported over three spans of 5m, 3m and 2.5m respectively. The beam carries point loads of 70KN and 50KN at 2.5m and 6.0m from the support A and a uniformly distributed load of 20KN/M over the span CD. Find the moments and reactions at the supports using the three moment theorem method of analysis and draw the bending moment and shear force diagrams.   (30 marks)

2   A beam ABCD 9m long is simply supported at A, B, and C, such that the length AB is 3m, length BC is 4.5m and the overhang CD is 1.5m. It carries a uniformly distributed load of 1.5KN/M in span AB and a point load of 1KN at the free end D. The moments of inertia of the beam in span AB and CD is I and that in span BC is 2I. Using three moment theorem method, analyze the structure and draw the bending moment and shear force diagrams for the beam.   (20 marks)

3   The fiqure below shows a statically indeterminate beam with loading as shown in the figure

Using moment distribution methods determine the moment over the beam and draw the bending moment diagram. Also calculate the reactions at the supports and draw the shear force diagram. (20 marks)

4.   Using a three moment theorem equation, analyse a continuous beam simply supported over three spans given that AB=8M, BC=12M and CD=5M. It carries a uniformly distributed load of 4KN/M in span AB, 3KN/M in span BC and 6KN/M in span CD. Find the moments over the supports B and C.   Also determine the reactions at the supports and draw the bending moment and shear force diagrams. (20 marks)

5.   Using moment distribution method determine the moments and support reactions for the portal frame shown below. (20 marks)