



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)
Faculty of Engineering and Technology

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

CERTIFICATE IN TECHNOLOGY I

EBC 1114: ANALYSIS OF FORCES IN TRUSSES

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2011

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions in two sections **A & B**

Answer question **ONE (COMPULSORY)** and any other **TWO** questions.

Maximum marks for each part of a question are clearly shown

This paper consists of **THREE** printed pages

SECTION A (COMPULSORY)

Question 1

- a) In your own words, define a truss and give basic assumptions taken when dealing with problems on trusses (3 marks)
- b) Calculate the magnitude of the resultant of the system of loads shown in the figure below and find its angle of inclination to the horizontal angle are 30° , 45° & 60° (7 marks)

Figure 1

- c) Determine the force in members BE, BJ, DJ and IJ using method of section. (ADJ and HDB are not continuous, each consist of two elements) (15 marks)

Figure 2

SECTION B (Answer any TWO questions from this section)

Question 2

Using a method of joint resolution, find the forces in all the members of the truss shown in the diagram below that is inclined at 30° to the horizontal (15 marks)

Figure 3

Question 3

A simply supported girder AG carries loads as shown below. Determine the force in each member of the frame and state whether the member is in compression or tension. (As sloping members are at 60° to the horizontal) (15 marks)

Figure 4

Question 4

Find the forces in members HG, CG, BC and CD & HC in a plane frame structure provided below using the method of tension coefficient (15 marks)

Figure 5

Question 5

Using the graphical method of truss analysis draw a Maxwell's diagram for the cantilever truss shown below which is subjected to loads 6KN, 10KN and 8KN respectively tabulating forces in each member (15 marks)

Figure 6