



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

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

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING
UNIVERSITY EXAMINATION FOR DEGREE IN BACHELOR OF SCIENCE
IN BUILDING & CIVIL ENGINEERING
EME 2106: WORKSHOP TECHNOLOGY I
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

Answer question **ONE (COMPULSORY)** from **SECTION A** and any other **TWO** questions from **SECTION B**

Maximum marks for each part of a question are clearly shown

This paper consists of **TWO** printed pages

SECTION A (COMPULSORY)

Question 1

- Outline, based on workshop regulations and the factory act, the safety requirements as pertains to workshop (9 marks)
- Draw an independent scaffold, to show the structural requirements of the scaffold. Provide a sectional view, the elevation and details of the working platform. Clearly show all the safety features of the scaffold and other inbuilt platform. Clearly show all the safety features of the scaffold and other inbuilt features to enhance the stability of the scaffold (12 marks)
- Outline the setting out of a building, based on the Pythagoras theorem.
 - Detail the setting out process for the building shown in drawing No.q3/wp/11D (9 marks)

SECTION B (Answer any TWO questions from this section)

Question 2

- a) Discuss the choice of foundations, to meet the structural requirements of various forms of buildings. (8 marks)
- b) It is proposed to use short bored in-situ pile foundations to a depth of 4.5m for the proposed building-03/wp/11dec.
- (i) With the aid of suitable sketches, briefly describe the construction principles of these foundations
 - (ii) Detail a system of ground beams interlinked with pile caps to evenly distribute the building loads and minimize differential settlement (12 marks)

Question 3

- a) With the aid of suitable diagrams, illustrate the safety regulations which pertain to the construction of stairs
- b) (i) Design a half turn staircase for the proposed building shown in drawing no.03/wp/11dec
(iii) Draw a sectional view and the plan of the staircase

Question 4

- a) Draw an elevation and a sectional view of a framed braced, standard match boarded door. (10 marks)
- b) Detail a concrete lintel for the door in 4 (a) to show the reinforcement, of the lintel and the frame of the door. (8 marks)

Question 5

- a) Explain with the aid of suitable sketches, the principles used in the construction of flat timber roofs, to highlight the use of herringbone strutting and furring pieces.
- b) Provide details of flat roof construction at the:
- (i) Eaves
 - (ii) Wall abutment