THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

Faculty of Engineering & Technology

DEPARTMENT OF CIVIL AND BUILDING ENGINEERING

CERTIFICATE IN CONSTRUCTION TECHNICIAN II (09A)

SEMESTER II EXAMINATIONS

APRIL/MAY 2010 SERIES

EB 1115 : THEORY OF DEFLECTION

TIME: 2 HOURS

Instructions to Candidates

You should have the following for this examinations:

- Answer booklet
- Pocket calculation

This paper consists of **FIVE** Questions in **TWO** Sections **A** and **B.**

Answer question **ONE** in Section **A** and choose **TWO** Questions from Section **B.**

Maximum marks for each part of a question is as shown.

Question ONE

(a).   Using a sketch, derive the General differential equation

$$M\!\!\Big/\!\!_{EI} = \frac{d^2 y}{dx^2}.$$ **(12 Marks)**

(b).   Determine and define:

(i)   Mohr's first moment area theorem
(ii)
(iii)   Mohr's second moment area theorem   **(8 Marks)**
(iv)

SECTION B

Question TWO

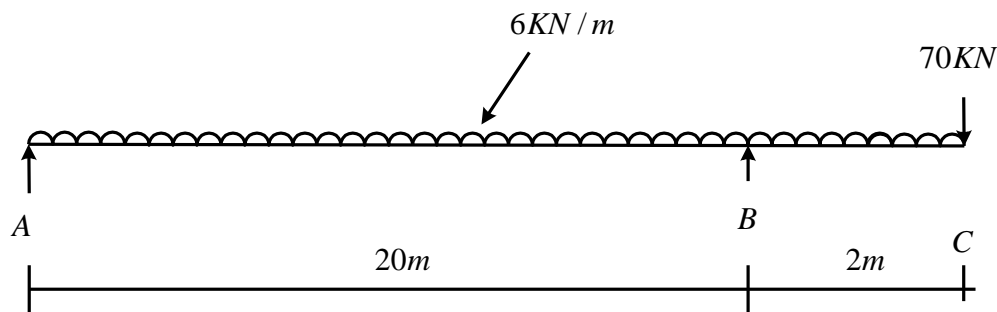Determine maximum deflection in Figure I using general differential equation.

$6KN/m$

$70KN$

A

B

C

$20m$

$2m$

Fig. I

(20 Marks)

Question THREE

Using Macaulay's method determine deflection at the mid span of figure 2.

$50KN$ $75KN$ $100KN$

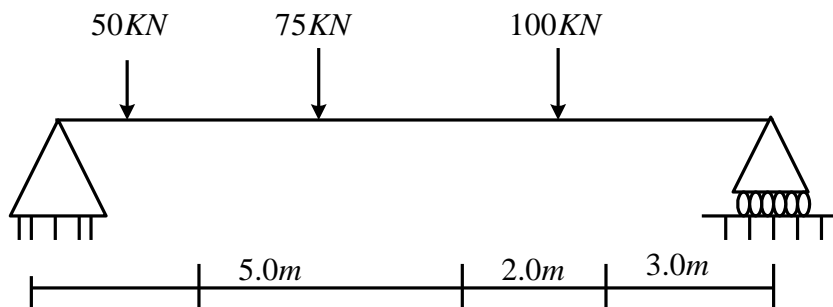$5.0m$ $2.0m$ $3.0m$

Fig. 2

(20 Marks)

Question FOUR
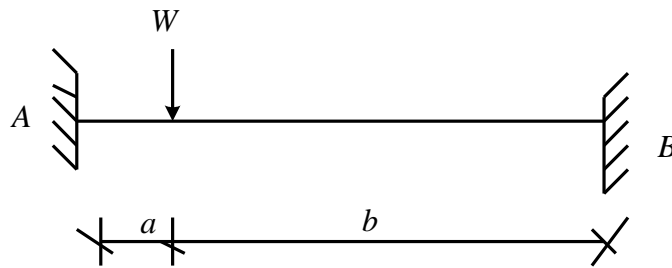
Determine Fixed end moments for the bedm in Fig. 3.

Fig. 3

(20 marks)

Question FIVE

Figure 4 shows a truss whose member's cross-sectional area is 1300mm². Young's modulus E = 200KN/mm². Using the unit load method, calculate the vertical displacement of joint D.
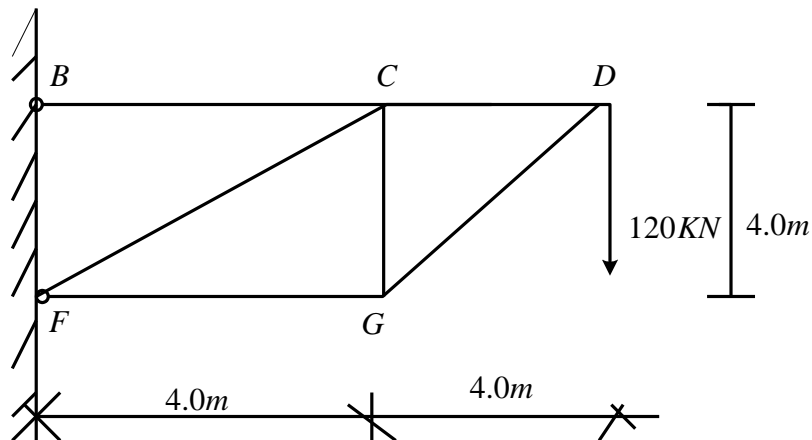

Fig. 4

(20 Marks)