(University of Choice)

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

MAIN CAMPUS

UNIVERSITY REGULAR EXAMINATIONS
2014/2015 ACADEMIC YEAR

SECOND YEAR SECOND SEMESTER EXAMINATIONS

FOR THE DEGREE
OF
BACHELOR OF SCIENCE IN CIVIL AND STRUCTURAL ENGINEERING

COURSE CODE: **CSE 212**

COURSE TITLE: **THEORY OF STRUCTURES II**

DATE: THURSDAY, 11TH JUNE 2015 **TIME:** 2.00PM – 5.00PM

INSTRUCTIONS:

1. This paper contains **SIX** questions
2. Answer any **FIVE** Questions
3. Marks for each question are indicated in the parenthesis.
4. Examination duration is **3 Hours**

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 3 Printed Pages. Please Turn Over.

Question One

(a) Show your understandingof the Area-Moment Theorems. (4 Marks)
(b) Using the area-moment theorems find expressions for vertical reactions and moments at supports of the beam shown in Figure Q1a.(10 Marks)

Question Two

(a) State and elaborate the Castigliano's theorems (4 Marks)
(b) Using Castigliano's theorem determine the forces in the members of the truss shown in Figure Q2 if member BC was short by 5mm before joining it to joint C. All members have same axial rigidity i.e 100 000kN/mm^2. (10 Marks)

Question Three

(a) Analyze the continuous beam shown in Figure Q3 by three moment equation. (10 Marks)
(b) Draw the shear force and bending moment diagrams. (4 Marks)

Question Four

(a) Use moment distribution method to analyze the frame shown in Figure Q4. (10 Marks)
(b) Draw the shear force and bending moment diagrams. (4 Marks)

Question Five

(a) Analyze the beam shown in Figure Q5 using slope deflection equations. (10 Marks)
(b) Draw the shear force and bending moment diagrams. (4 Marks)

Question six

(a) Derive the critical (Buckling Load) for a column fixed at one end and free at the other end. (10 Marks)
(b) If the column in (a) has a length of 4m, what will be the critical load.EI = 80000kN/mm^2. (4 Marks)

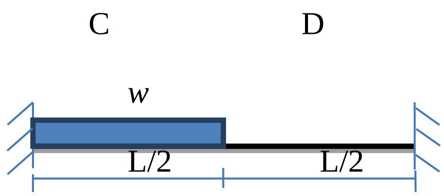

Fig. Q1 EI is constant

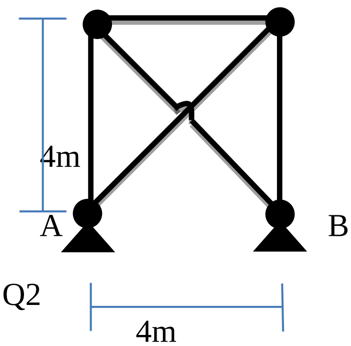

Fig. Q2

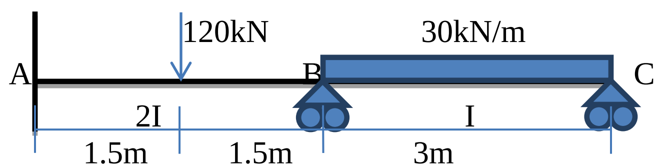

Fig. Q3

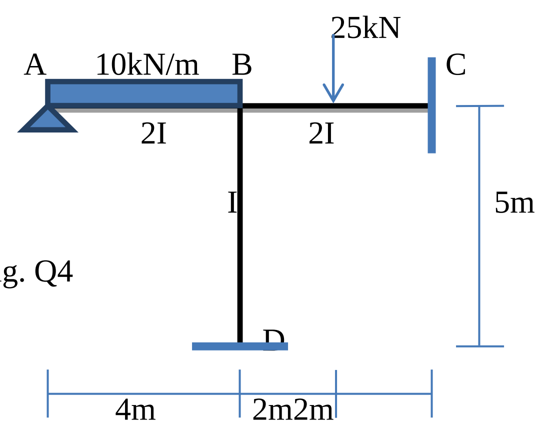

Fig. Q4

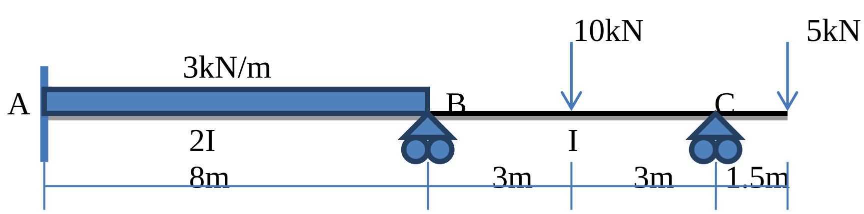

Fig. Q5