COLLEGE OF ENGINEERING AND TECHNOLOGY

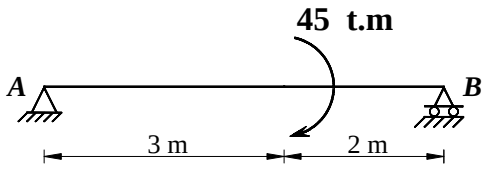
DEPARTMENT **: *Construction* and *Building* Engineering**
COURSE **: *Structural Analysis 2*** ***COURSE NO*** **: *CB* 343**
LECTURER **: *Dr.* Mohamed SAAFAN**
T. ASSISTANT **: *Eng.*** Mostafa Yossef **, *Eng.*** Al-Hussein Hilal

"Spring 2012 – 2013"

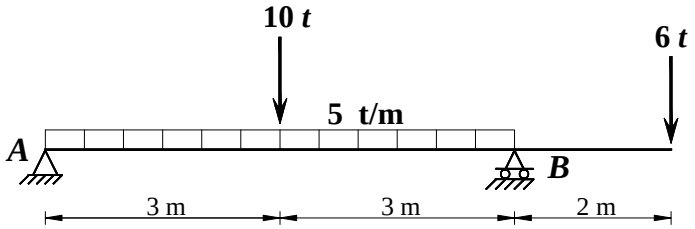
SHEET 1

Draw the ***internal force diagrams***

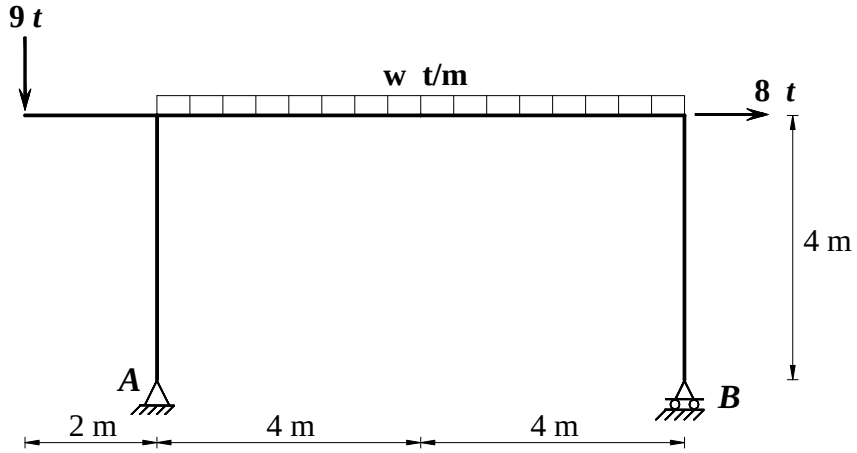
1.



2.



3.



COLLEGE OF ENGINEERING AND TECHNOLOGY

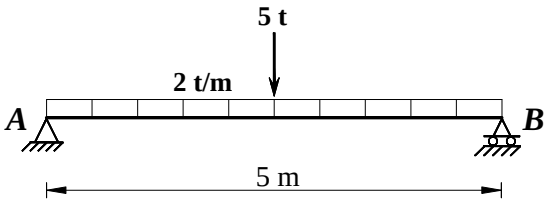
DEPARTMENT **: *Construction* and *Building* Engineering**
COURSE **: *Structural Analysis 2*** ***COURSE NO*** **: *CB* 343**
LECTURER **: *Dr.* Mohamed SAAFAN**
T. ASSISTANT **: *Eng.*** Mostafa Yossef **, *Eng.*** Al-Hussein Hilal

"Spring 2012 – 2013"

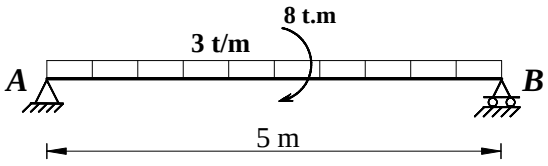
SHEET 2

1 Using the ***Principal Of Superposition*** , ***Draw*** the Bending Moment Diagram and Shear Force Diagram for the following *Beams* :

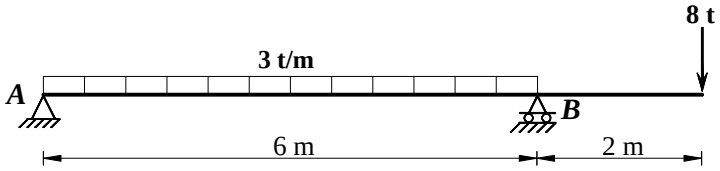
1.1



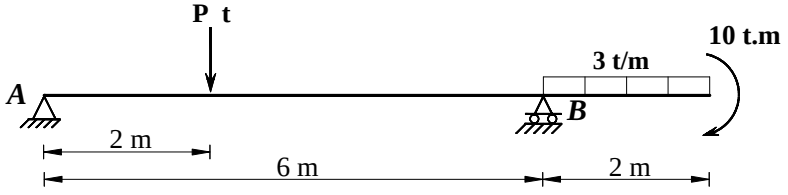
1.2



1.3



1.4



COLLEGE OF ENGINEERING AND TECHNOLOGY

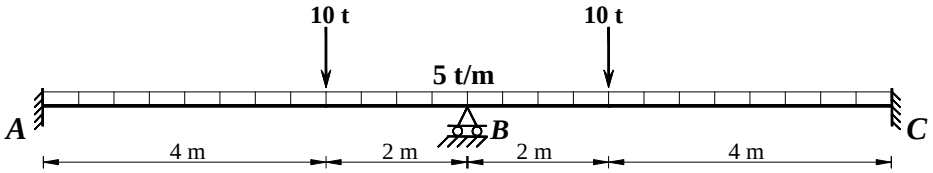
DEPARTMENT **: *Construction* and *Building* Engineering**
COURSE **: *Structural Analysis 2*** ***COURSE NO*** **: *CB* 343**
LECTURER **: *Dr.* Mohamed SAAFAN**
T. ASSISTANT **: *Eng.*** Mostafa Yossef **, *Eng.*** Al-Hussein Hilal

"Spring 2012 – 2013"

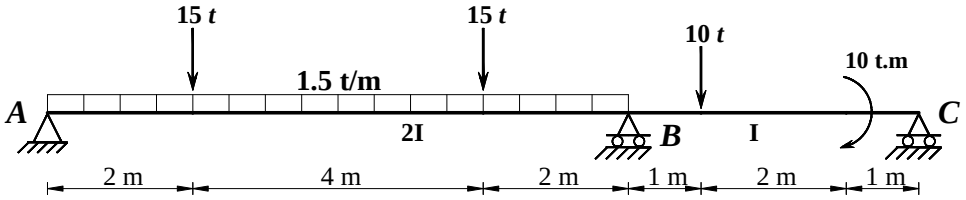
SHEET 3

1 Using the ***3 Moment Equation Method*** , ***Draw*** the Bending Moment Diagram and Shear Force Diagram for the following *Beams* :

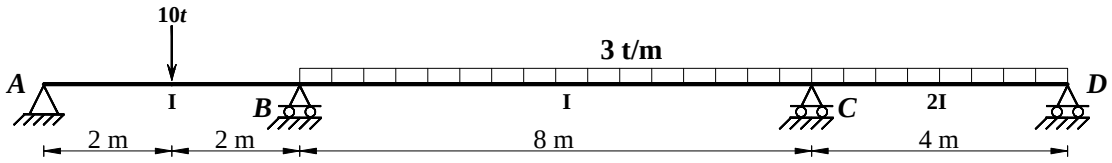
1.1



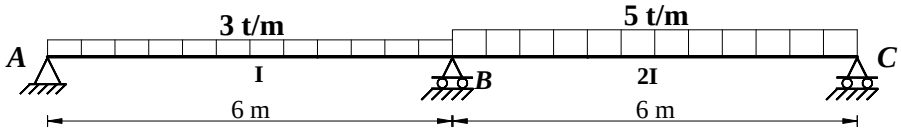
1.2



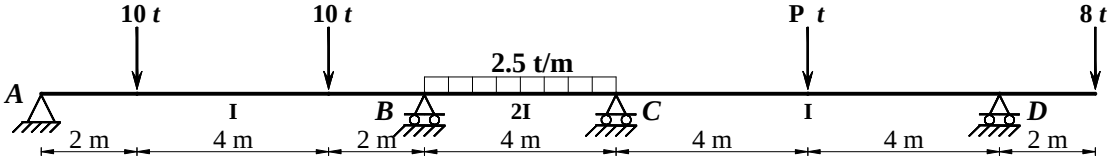
1.3



1.4 settlement of ***support B*** = 4 cm (***EI*** = 5000 t.m^2)



1.5 settlement of ***support B*** = 4 cm, and settlement of ***support C*** = 2 cm (***EI*** = 5000 t.m^2)



COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT **: *Construction* and *Building* Engineering**
COURSE **: *Structural Analysis 2*** ***COURSE NO.*: *CB* 343**
LECTURER **: *Dr.* Mohamed SAAFAN**
T. ASSISTANT **: *Eng.*** Mostafa Yossef **, *Eng.*** Al-Hussein Hilal

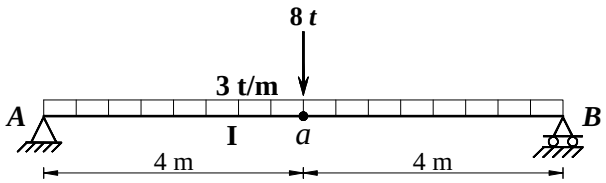
"Spring 2012 – 2013"

SHEET 4

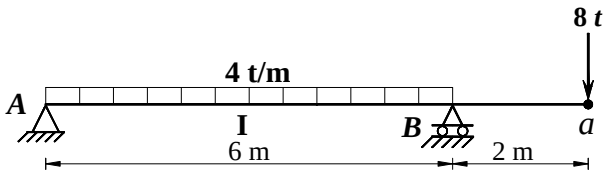
Using the ***Virtual Work Method*** :

1 Calculate the ***deflection*** & ***rotation*** at point (***a***) in term of ***EI*** :

1.1

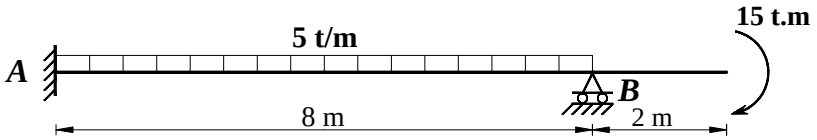


1.2

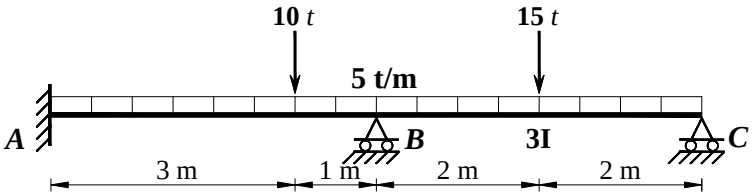


2 Draw the ***Bending Moment Diagram*** for the following Beams :

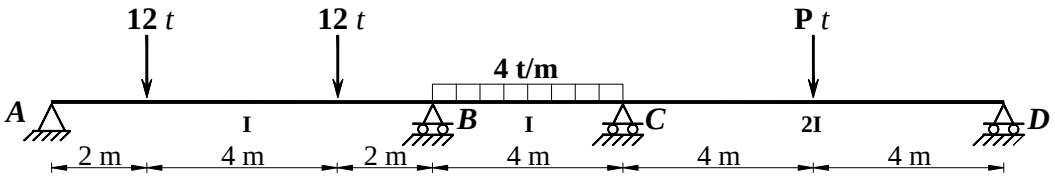
2.1



2.2



2.3 settlement of ***support C*** = 4 cm (***EI*** = 5000 t.m^2)



COLLEGE OF ENGINEERING AND TECHNOLOGY

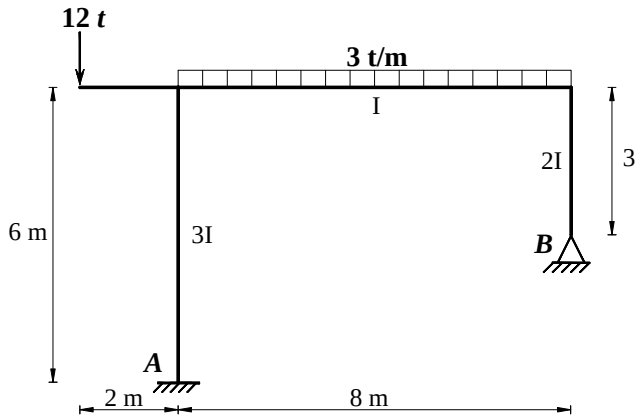
DEPARTMENT **: *Construction* and *Building* Engineering**
COURSE **: *Structural Analysis 2*** ***COURSE NO*** **: *CB* 343**
LECTURER **: *Dr.* Mohamed SAAFAN**
T. ASSISTANT **: *Eng.*** Mostafa Yossef **, *Eng.*** Al-Hussein Hilal

"Spring 2012 – 2013"

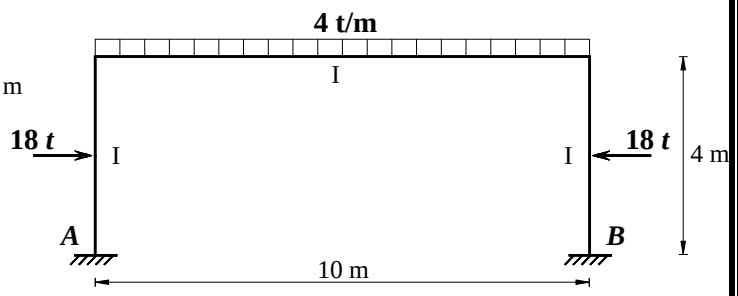
SHEET 5

1 Using the ***Virtual Work Method*** , Draw the ***Bending Moment Diagram*** for the following Frames:

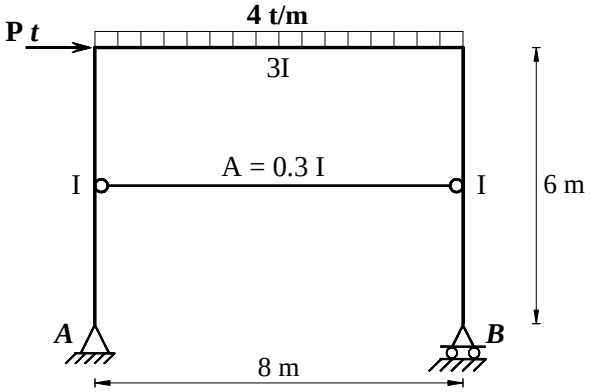
1.1



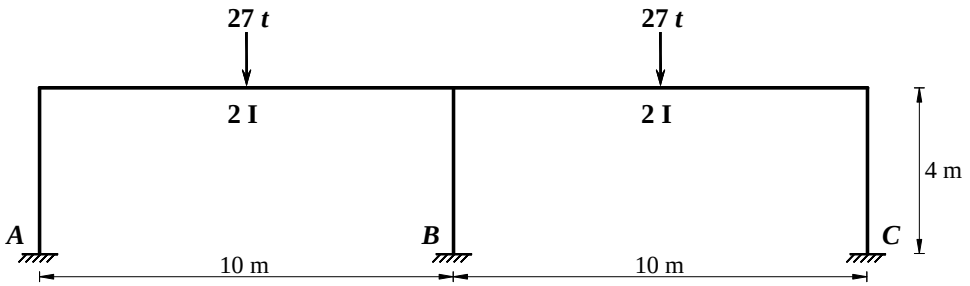
1.2



1.3



1.4



COLLEGE OF ENGINEERING AND TECHNOLOGY

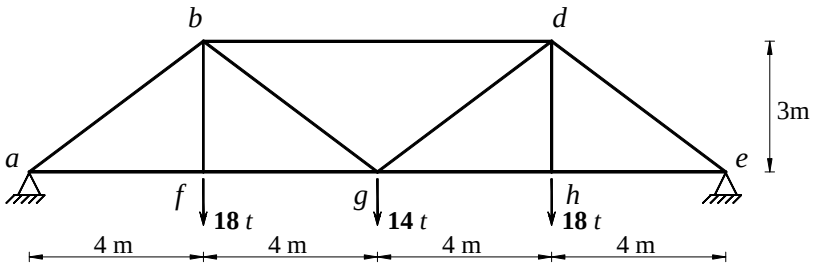
DEPARTMENT **: *Construction* and *Building* Engineering**
COURSE **: *Structural Analysis 2*** ***COURSE NO*** **: *CB* 343**
LECTURER **: *Dr.* Mohamed SAAFAN**
T. ASSISTANT **: *Eng.*** Mostafa Yossef **, *Eng.*** Al-Hussein Hilal

"Spring 2012 – 2013"

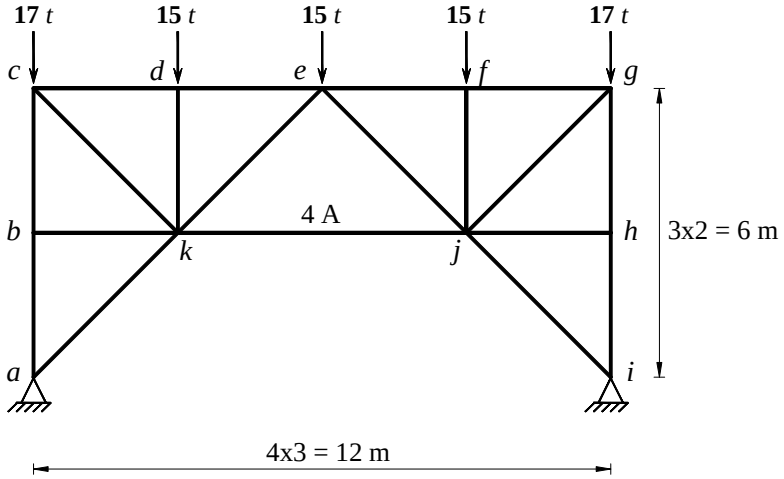
SHEET 6 (Part 1)

1 Using ***Virtual Work Method ,*** Find the ***Internal Forces*** in members for the following ***Trusses*****:**

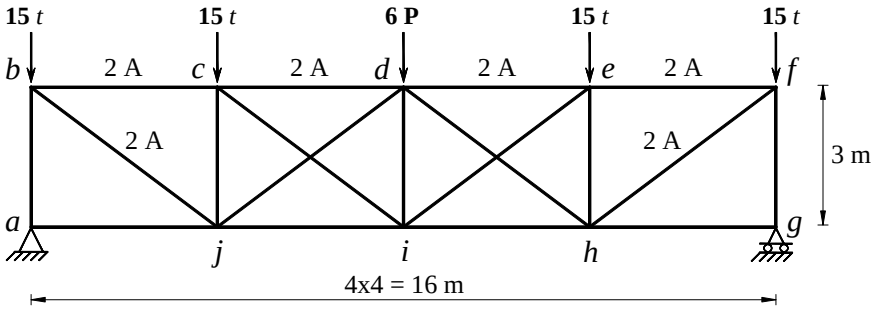
1.1



1.2



1.3



COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT **: *Construction* and *Building* Engineering**
COURSE **: Structural Analysis *2*** ***COURSE NO* : *CB* 343**
LECTURER **: *Dr.* Mohamed SAAFAN**
T. ASSISTANT **: *Eng.*** Mostafa Yossef **, *Eng.*** Al-Hussein Hilal

"Spring 2012 – 2013"

SHEET 6 (Part 2)

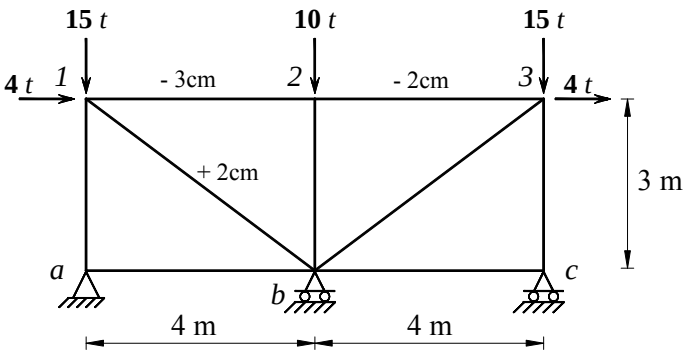
2 Using ***Virtual Work Method ,*** Find the ***Internal Forces*** in members for the following ***Trusses*** due to **:**
(EA = 40000 t)
case (1): ***Settlement*** of support.
case (2): ***Fabrication*** Error.

Member	*Fabrication*
B-1	+ 2 cm
1-2	- 3 cm
2-3	- 2 cm

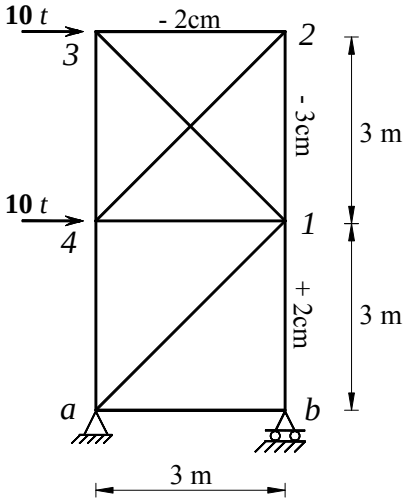
Problem	*Settlement*
2.1	Δ_B = 2 cm

case(3): these members have ***increase*** of ***temperature*** = + 40 ° c.

2.1



2.2



COLLEGE OF ENGINEERING & TECHNOLOGY

Department : Construction and Building Engineering
Course : Structural Analysis 2 **Course No:** CB 343
LECTURER : ***Dr.*** **Mohamed SAAFAN**
T. ASSISTANT : ***Eng.*** Mostafa Yossef , ***Eng.*** Al-Hussein Hilal
"Spring 2012 – 2013"

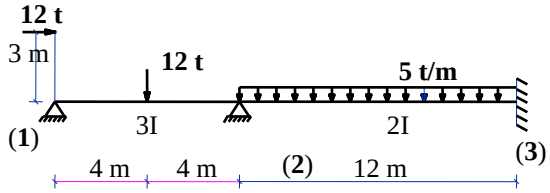
SHEET 7

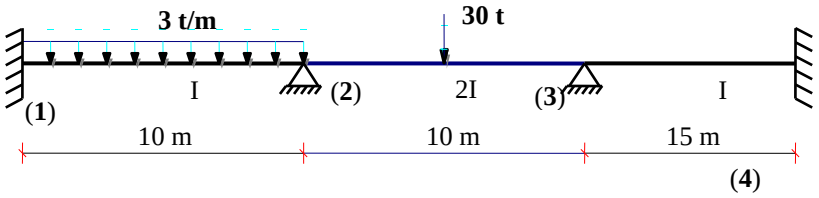
Using the ***slope deflection method*** of structural analysis:

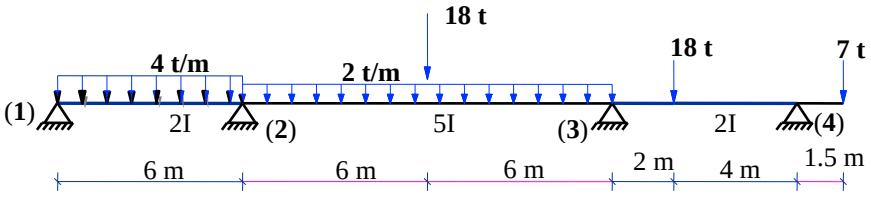
1- Draw the internal forces in all the following four continuous beams subjected to the indicated loads.

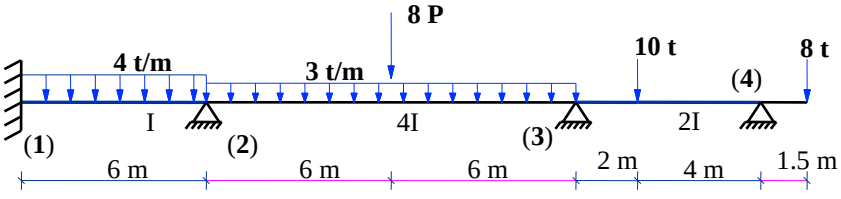
2- If the continuous beams (*problems 3 and 4 only)* have settlement at support (**2**) equal to 5 cm. draw the internal forces due to settlement only.

The relative inertia of each beam members are as given. E I = $2x10^4$ $t.m^2$









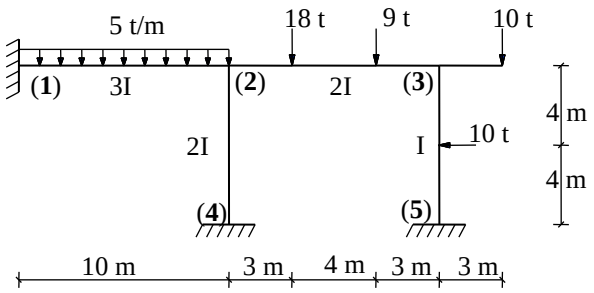
COLLEGE OF ENGINEERING & TECHNOLOGY

Department : Construction and Building Engineering
Course : Structural Analysis 2 **Course No:** CB 343
***LECTURER* : *Dr.* Mohamed SAAFAN**
T. ASSISTANT* : *Eng. Mostafa Yossef **, *Eng.*** Al-Hussein Hilal
"Spring 2012 – 2013"

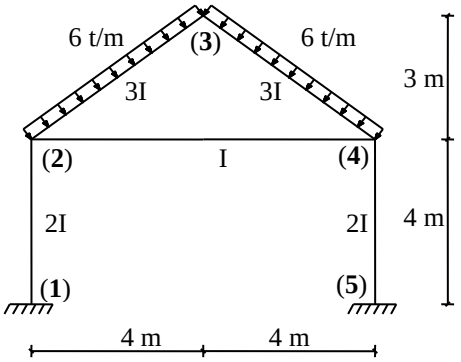
Sheet 8 (Part 1)
Frames without sway

A) Draw the possible sway mode for each of the following frames.

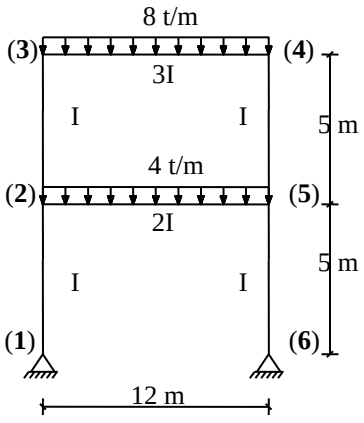
B) Using the slope deflection method of structural analysis draw the internal forces for:



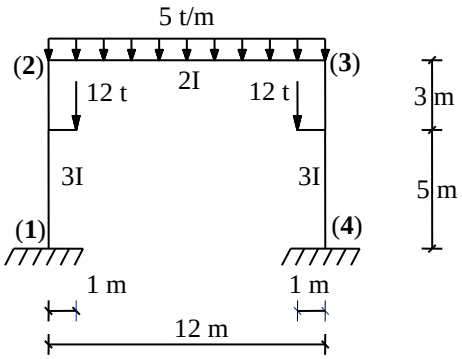
Problem # 1



Problem # 2



Problem # 3



Problem # 4

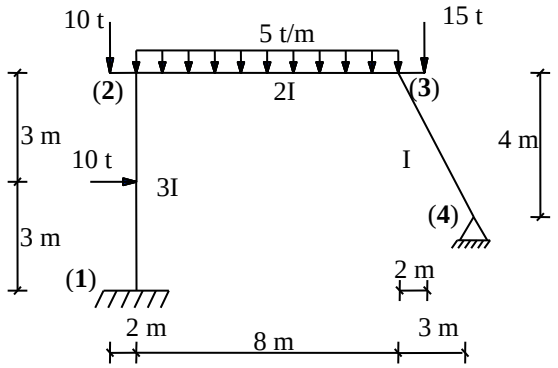
COLLEGE OF ENGINEERING & TECHNOLOGY

Department : Construction and Building Engineering
Course : Structural Analysis 2 **Course No:** CB 343
***LECTURER* : *Dr.* Mohamed SAAFAN**
T. ASSISTANT* : *Eng. Mostafa Yossef **, *Eng.*** Al-Hussein Hilal
"Spring 2012 – 2013"

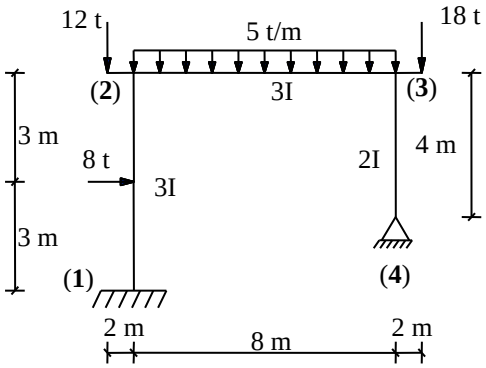
Sheet 8 (Part 2)
Frames with sway

A) Draw the possible sway mode for each of the following frames.

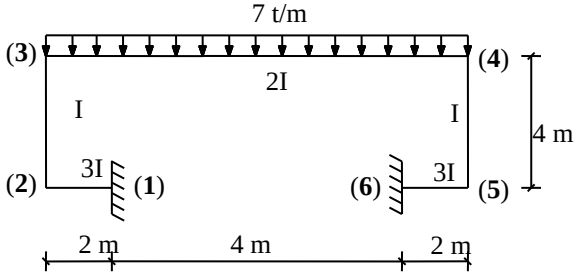
B) Using the slope deflection method of structural analysis draw the internal forces for:



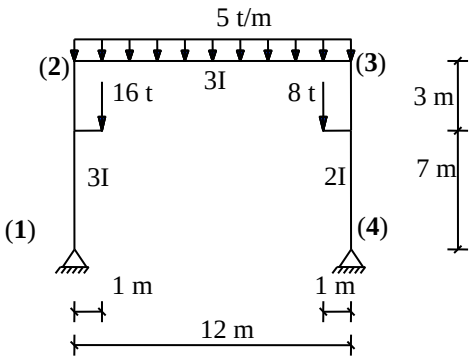
Problem # 5



Problem # 6



Problem # 7



Problem # 8

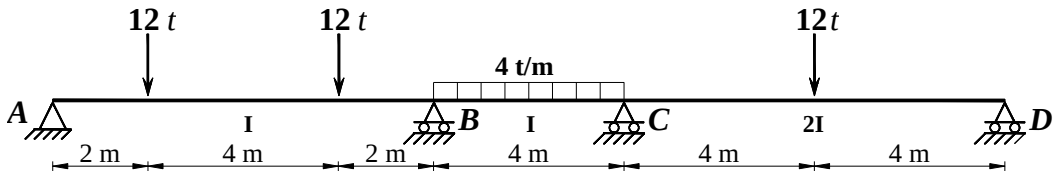
COLLEGE OF ENGINEERING & TECHNOLOGY

Department : Construction and Building Engineering
Course : Structural Analysis 2 **Course No:** CB 343
***LECTURER* : *Dr.* Mohamed SAAFAN**
T. ASSISTANT* : *Eng. Mostafa Yossef **, *Eng.*** Al-Hussein Hilal
"Spring 2012 – 2013"

Sheet 9
Moment Distribution Method

A) Using the moment distribution method, Draw B.M.D for:

1) settlement of ***support C*** = 3 cm (***EI*** = 5000 t.m^2)



2)