

## Module 2 : Analysis of Statically Determinate Structures

### Lecture 10 : Tutorial Problems

#### Objectives

In this course you will learn the following

- Some tutorial problems related to this module.

#### TUTORIAL PROBLEMS

Find the forces in  $EC$ ,  $EF$  and  $HF$  in the following Figure T2.1.

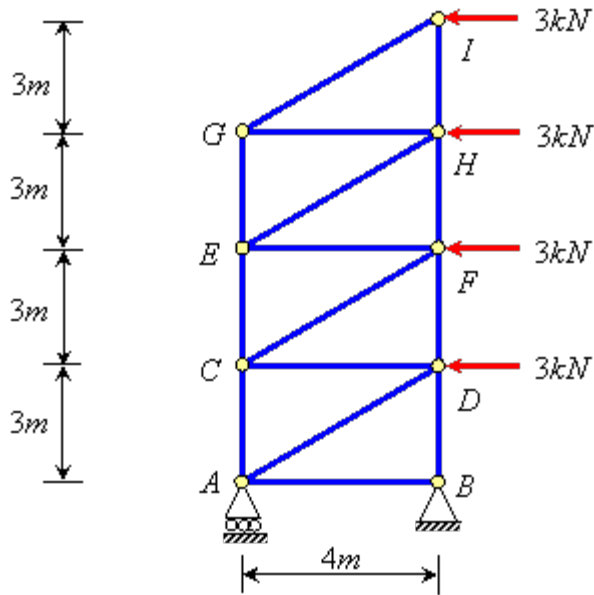


Figure T2.1

Find the forces in all members in the following Figure T2.2.

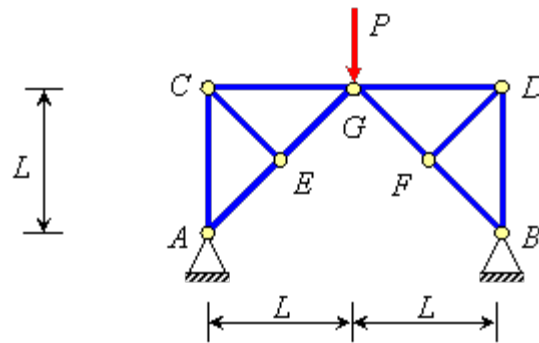


Figure T2.2

Find the internal force at moment  $A$  in Figure T2.3.

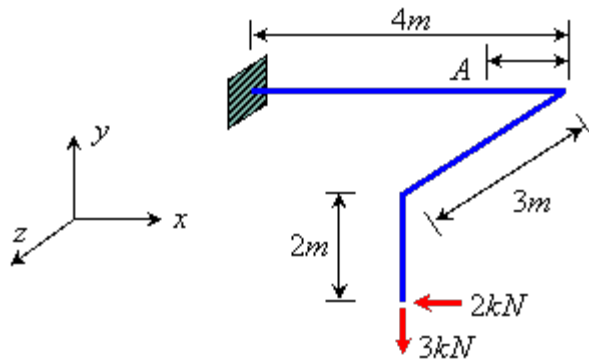


Figure T2.3

T2.4 Find Bending Moment Diagram (BMD) and Shear Force Diagram (SFD) of the beams in Figure T2.4.

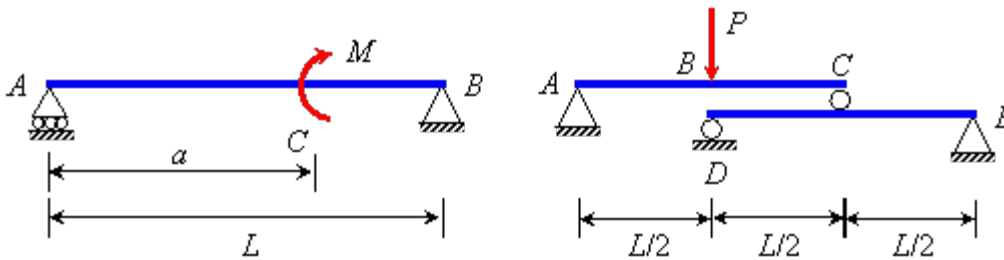


Figure T2.4

T2.5 Find the shape ( $y$  as a function of  $x$ ) of the parabolic three hinges arch for which bending moment will be zero at every section.

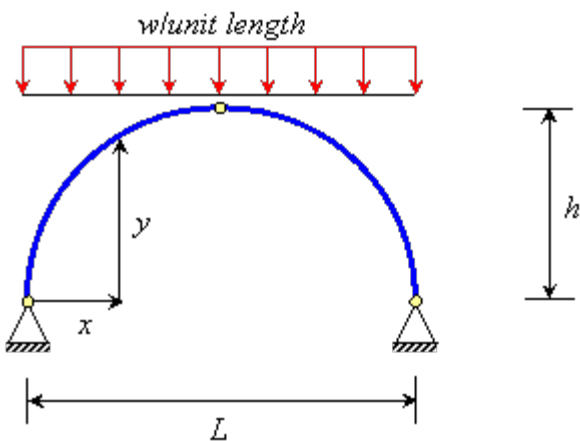


Figure T2.5

T2.6 Find the bending moment under the load for the circular three hinged arch.

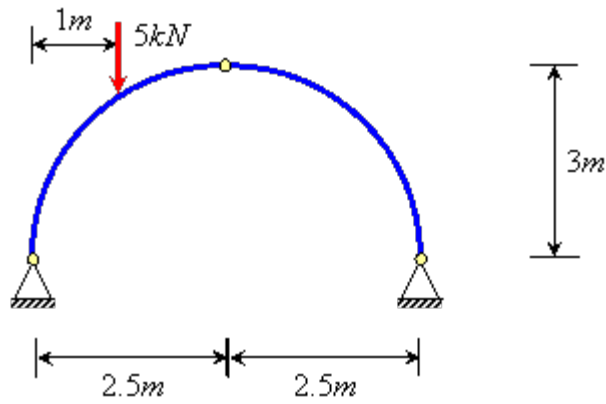


Figure T2.6

### Recap

In this course you have learnt the following

- You have learned some tutorial problems related to this module.

### Answers of tutorial problems

T2.1  $F_{BC} = -6.75 \text{ kN}$

$$F_{HF} = 6.75 \text{ kN}$$

$$F_{BF} = 6 \text{ kN}$$

T2.2  $F_{AC} = F_{BD} = F_{CE} = F_{FD} = F_{CG} = F_{DG} = 0$

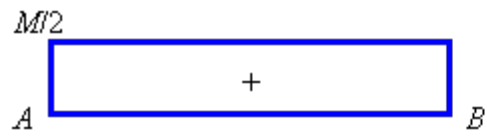
$$F_{AE} = F_{BF} = F_{BG} = F_{GF} = P / \sqrt{2}$$

T2.3  $P_x = -2 \text{ kN}, V_y = -3 \text{ kN}, V_z = 0$

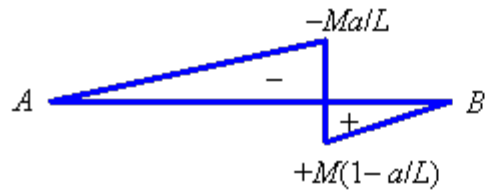
$$T_x = 9 \text{ kNm}, M_y = -6 \text{ kNm}, M_z = -7 \text{ kNm}$$

### Answers of tutorial problems

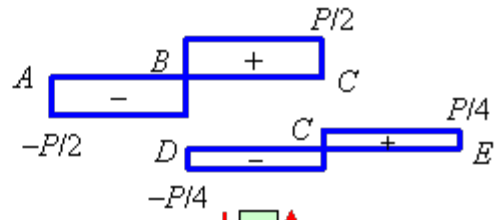
T2.4



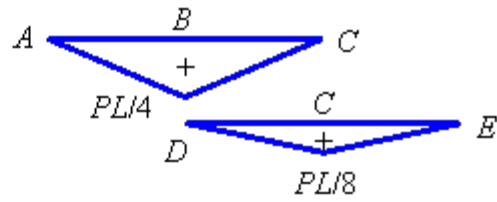
SFD



BMD



SFD



BMD

T2.5  $y = 4h \left( \frac{x}{L} - \frac{x^2}{L^2} \right)$

T2.6  $2 \text{ kNm}$