

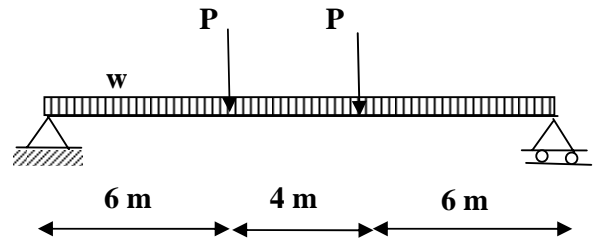
## CE 473 : Steel Structures

### Assignment: 6 Strength and Design of Beams

#### Problem 1:

For the shown simple beam given;

	Dead load	Live load
<b>P</b>	<b>30 kN</b>	<b>20 kN</b>
<b>w</b>	<b>40 kN/m</b>	<b>30 kN/m</b>



Find the lightest W-shape A36, section for the following two cases

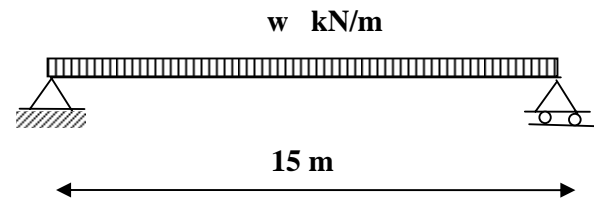
- 1- The top flange is laterally supported at points of concentrated loads
- 2- The top flange is only laterally supported at ends

For each of the above cases;

- 1- Check the shear strength of beam
- 2- Check the maximum deflection

#### Problem 2:

Determine the maximum ultimate load ( $w$ ) that can be applied on the given simple beam that its section is W 760 x 147 for the both given cases, with considering the maximum allowed deflection don't exceed  $L/360$ ;



- 1- The top flange is continuously laterally supported by RC slab
- 2- The top flange is only laterally supported at ends and at 5m apart

#### Problem 3:

The given over hanging beam is laterally supported only at supports;

- 1- If  $P = 20$  kN and the free end of the cantilever is laterally supported, find the lightest W shape section.
- 2- If the beam has a section of W 610 x 92, and the free end of the cantilever is not laterally supported, determine the maximum value of  $P$ .

