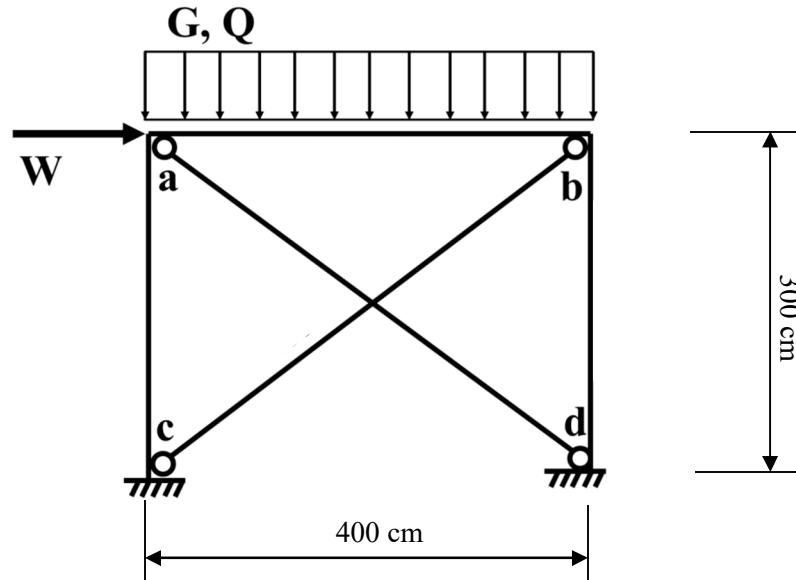


Submission Date: **28.03.2019**



**Figure 1**

- The braced frame shown in the figure 1, is subjected to dead (G), live (Q) and wind (W) forces. Beams and columns are formed with IPE sections and brace elements are UPN sections. Connection details of braces at a, b, c and d are given in the Figure 2. Figure 3 shows the axial normal force produced in braces under vertical unit distributed line load and lateral unit point load respectively. Structural steel material is S355. Considering the parameters given in the Table 1, please determine appropriate UPN sections for brace members under the combinations of  $1.2G + 1.6Q$  and  $1.2G + Q + 1.6W$ . Dimensions are in mm unless otherwise is specified.

**Table 1.** Student Parameters

G (kN/m):	$(G+1)*5 + H$
Q (kN/m):	$B*10 + F$
W (kN):	$E*10$
$l_w$ (mm):	$100 + A*100 + B*10$
$l_b$ (mm):	$40 + B*5$

	A	B	C	D	E	F	G	H
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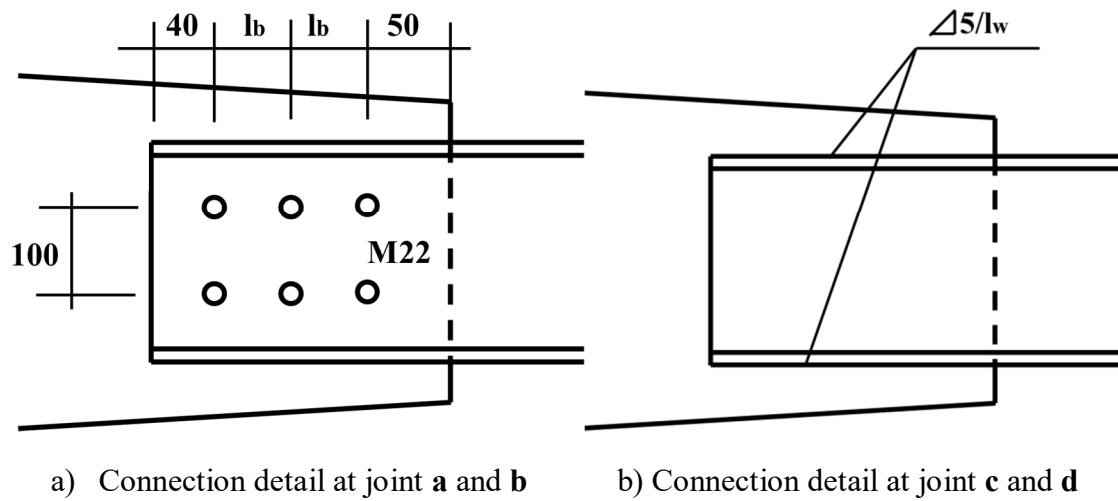


Figure 2

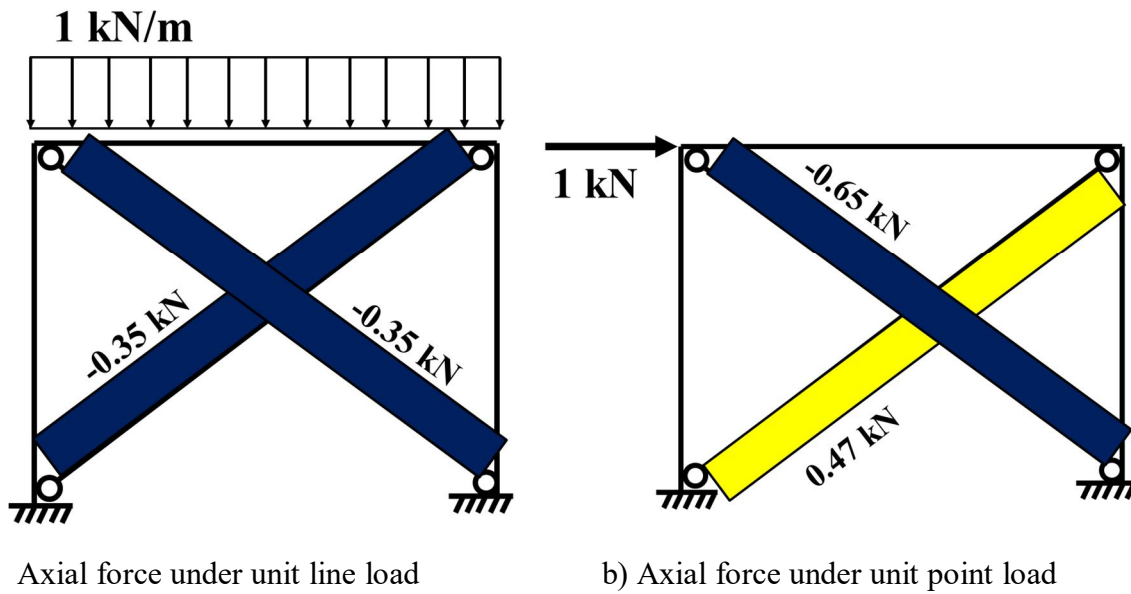


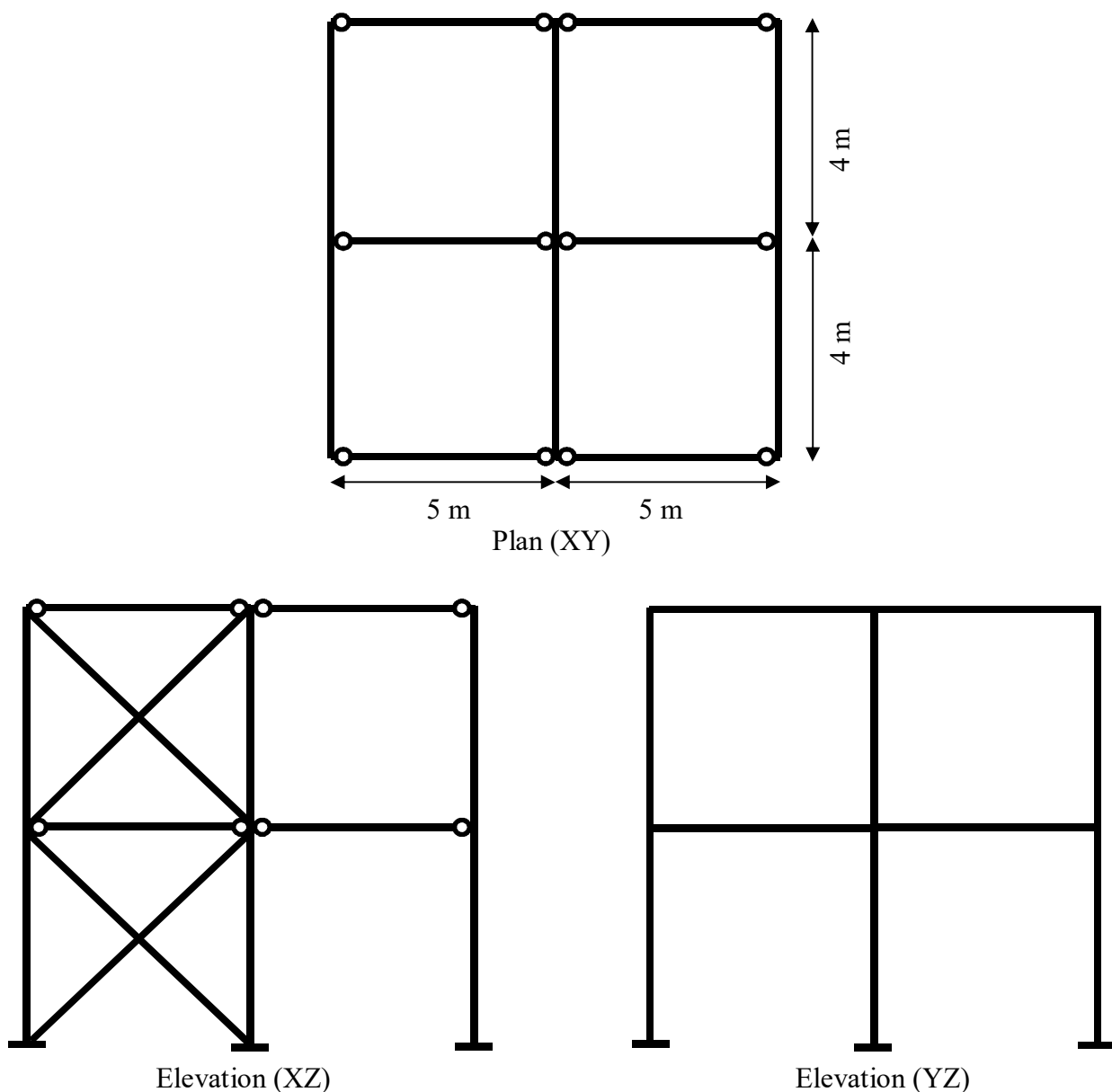
Figure 3

	A	B	C	D	E	F	G	H
Student No:								

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2. Build a 1:50 scaled balsa wood model of the two-story structure whose plan and elevation are given in Figure 4. Bay width in X direction is 5 m and in Y direction 4 m. Story height is 4 m. Please note that the moment resisting beam-to-column connections require both flanges and the web of beams to be connected while simple beam-to-column connections are formed in cases that only beam web is connected. Wooden sticks with 5 and 15 mm thickness will be used to form frame sections.

Please take photos of your balsa model including a plan view, elevations from both sides and connection details, and add these image to your homework submission folder and also in a CD in digital form. Please attend with your models to the lecture after submission date. During this lecture, your models will be loaded until structural failure. Students that who do not attend to this lecture with his/her model will be failed from this part of the homework.



**Figure 4 – Plan and elevations**

	A	B	C	D	E	F	G	H
Student No:								