Simple Steelwork Competency Test.

This is a simple test created by Peers steelwork to assess the design knowledge of potential graduate design engineers. It specifically targets the fundamental principles which are used in every day design, especially connection design. The test should be completed in 30 minutes with the aid of a scientific calculator and some scrap paper.

Connection Design - Training Sheet 1 **Ref HPDT3**

1. Calculate the Ixx of a Rectangular Section 100mm Wide by 200mm Deep (Answer in cm4).

2. Calculate the Iyy of a Rectangular Shape 150mm Wide by 300mm deep (Answer in cm4).

3. Calculate the Zxx of a 200x20 thk flat (Answer in cm^3).

4. Calculate the Ryy of a 200x20 thk flat calculate (Answer in cm).

5. A beam fabricated out of flats has the following dimensions:-

Overall depth	=	650mm.
Flanges	=	180 x 20 thk flat.
Web	=	12mm thk plate

Calculate the following:-

a.	Area.	cm^2
b.	Ixx.	cm4
c.	Iyy.	cm4
d.	Zxx	cm^3
e.	Zyy	cm^3
f.	Rxx	cm
g.	Ryy	cm

6. A Box Section fabricated out of flats has the following dimensions:-

Overall depth	=	340mm.
Flanges	=	150 x 10 thk flat.
Webs	=	10mm thk plate

Calculate the following:-

h.	Area.	cm^2
i.	Ixx.	cm4
j.	Iyy.	cm4
k.	Zxx	cm^3
l.	Zyy	cm^3
m.	Rxx	cm
n.	Ryy	cm

7. Calculate the Sxx (Plastic Modulus) for the member defined in question 5.

8. Calculate the Sxx & Syy for the member defined in question 6.

9. 14 Men each weighing 85kg stand on the end of a cantilever beam spanning 12m. Ignoring the weight of the beam calculate what reactions the beam connection should withstand.

10. The beam mentioned in question 9 has a 0.7 m deep end and just 2 bolt located at 50mm down from the top. Calculate what forces are present in each of the bolts and size them.

Anyone applying for a position above graduate level should be expected to achieve 100%.

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