Assignment 4
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Question 2

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$L = 1500\,mm$ $\quad c = 30mm$ $\quad \sigma_f = -600MPa$

$b = 35\,mm$ $\quad d = t + c$ $\quad \sigma_c = -4.5\,MPa$

$t = 3.5mm$ $\quad E = 75000MPa$ $\quad \tau_c = 2.6\,MPa$

Micro buckling

$$P = \frac{4bdt\sigma_f}{L}$$

$$= -6566\,N$$

core shear

$$P = 2bd\tau_c$$

$$= 6097\,N$$

Elastic Identation

$$P = bt\left(\frac{\pi^2 dE\sigma_c^2}{3L}\right)^{1/3}$$

$$= 5.8976 \times 10^3 = 5897.6\,N$$

Highest load that can be taken is through Micro buckling at $-6566N$, but the highest failure inducing load, is at Elastic Identation at $5897.6N$. With this being the lowest values means it's the first load to be reached ensuring its failure first among all others.

Code:

```
L=1500;%mm
b=35;%mm
t=3.5;
c=30;%mm
d=t+c;%mm
E=75000; %MPa
SigmaF=-600; %MPa Composite Compressive Strength
SigmaC= -4.5; %MPa Polymer Compressive Strength
TaoC= 2.6; %MPa Polymer Shear Strength


%Elastic Indentation
Pelasticindentation= b*t*((((pi^2)*d*E*(SigmaC^2))/(3*L))^(1/3))

%Core Shear
Pcoreshear= 2*b*d*TaoC

%Face Microbukling
Pmicrobuckling= (4*b*d*t*SigmaF)/L
```