

17 March  
Saturday

2018

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৩ চৈত্র ১৪২৪ বাংলা

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Cylindrical thin walled pressure vessel

08.00

09.00

10.00

11.00

12.00

Lunch

02.00

03.00

04.00

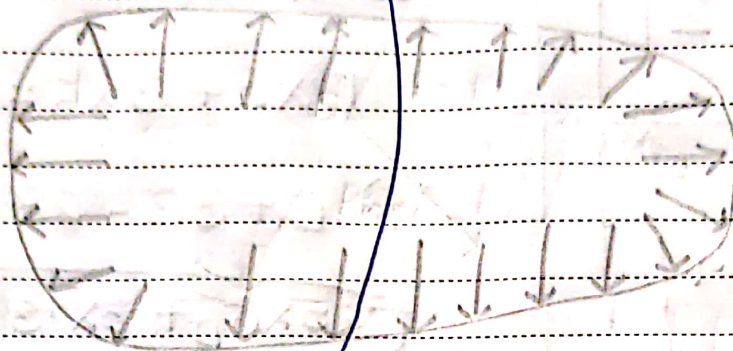
05.00

06.00

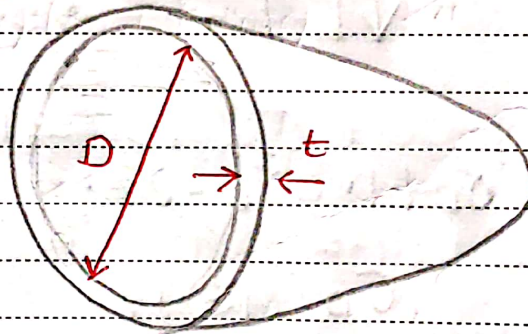
07.00

08.00

cut



cut



Thin walled: ratio of wall thickness to diameter

is so small that the distribution of normal stress on

a cut is essentially uniform through the thickness of the shell.

Note's

18 March  
Sunday

2018

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08.00

$$D_{in} \approx D_{out} \approx D$$

09.00

$$\frac{D}{t} \geq 20 \rightarrow \text{Thin walled vessel}$$

10.00

11.00

12.00

Lunch

02.00

03.00

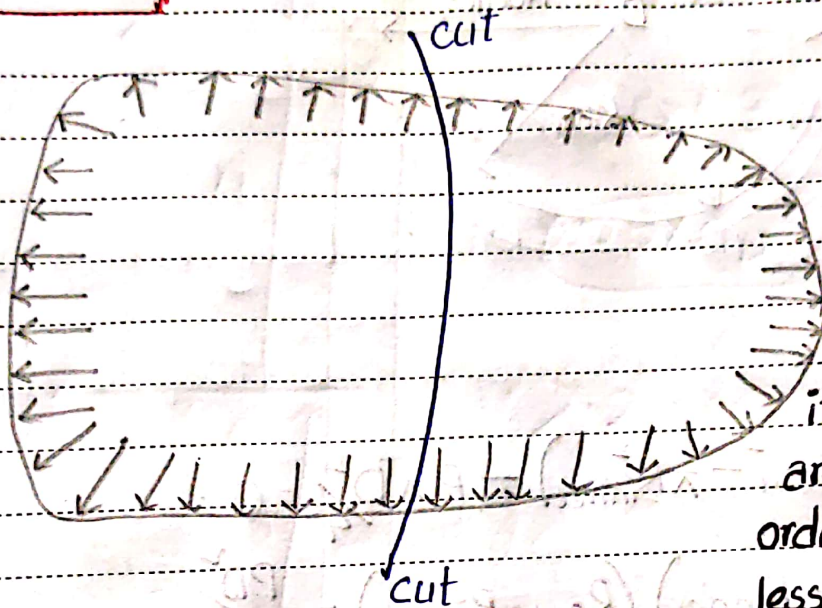
04.00

05.00

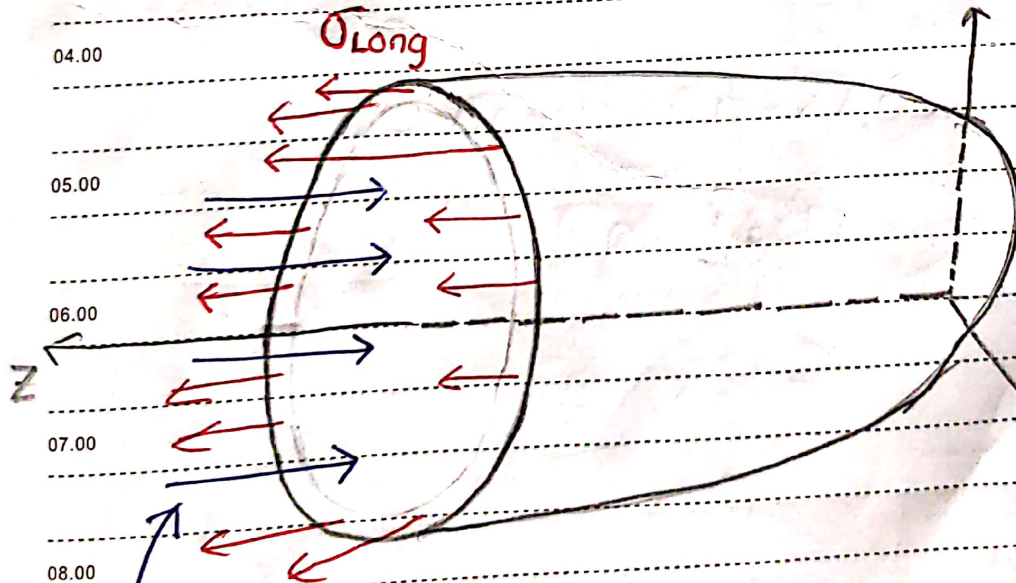
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08.00



We will neglect the weight of the contents & weight of the structure itself. These forces are generally many orders of magnitude less than the forces due to the internal pressure & the forces resulting from cross section.



$\sigma_{long}$  = longitudinal stress

$\rightarrow x$   $P = \text{force/area}$

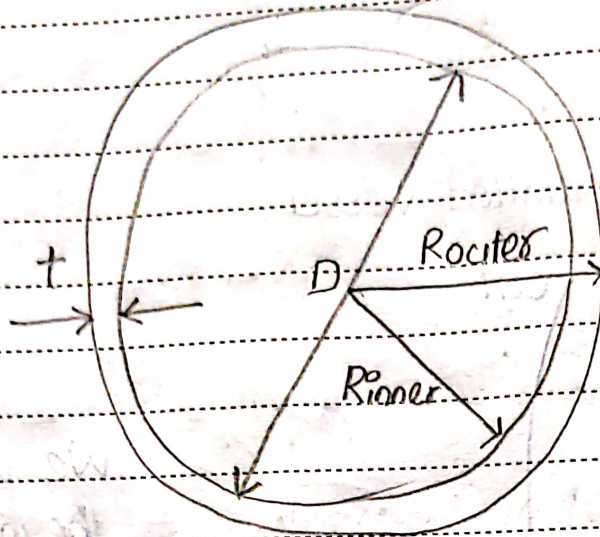
Note's

$P = \text{pressure per unit area}$

19 March  
Monday

2018

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08.00

09.00

10.00

11.00

12.00

Lunch

$$\Sigma F_z = 0$$

02.00

$$\sigma_{long} \times (\pi R_{out}^2 - \pi R_{inner}^2) - P \pi \frac{D^2}{4} = 0$$

03.00

$$\Rightarrow \sigma_{long} (R_{out} + R_{inner}) (R_{out} - R_{inner}) = \frac{PD^2}{4}$$

04.00

$$\Rightarrow \sigma_{long} Dt = \frac{PD^2}{4}$$

05.00

$$\Rightarrow \sigma_{long} = \frac{PD}{4t}$$

06.00

07.00

08.00

Note's

20 March  
Tuesday

2018

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08.00

$$P = \text{force/area}$$

09.00

10.00

11.00

12.00

Lunch

02.00

03.00

04.00

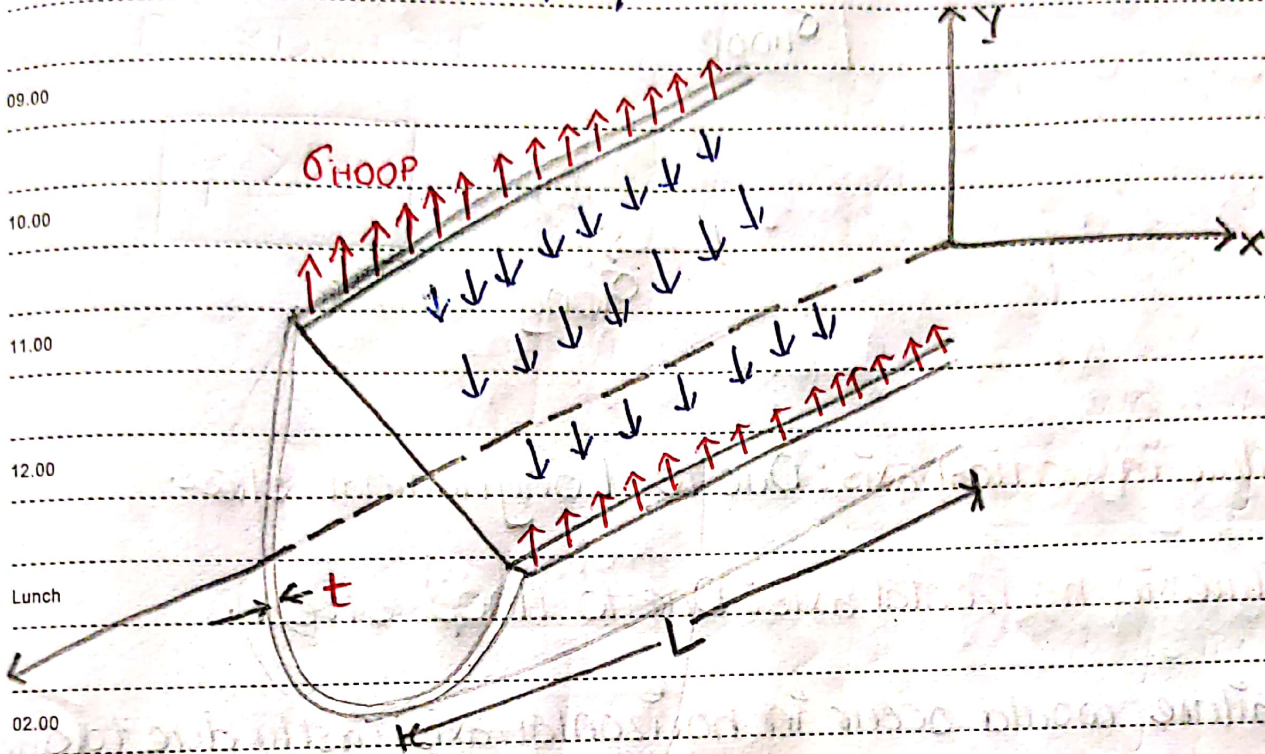
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06.00

07.00

08.00

Note's



$$\sum F_y = 0.$$

$$\sigma_{HOOP} \times 2tL - P \times LD = 0$$

$$\Rightarrow \sigma_{HOOP} \times 2t = PD.$$

$$\Rightarrow \sigma_{HOOP} = \frac{PD}{2t}$$