

Day: Friday

Date: 3 / Feb / 2023

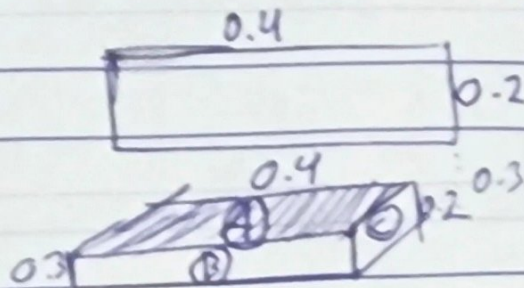
Pressure H.W

Question 1)

$$P = \frac{F}{A}$$



Force = 1200N
Length = 0.2m
width = 0.4m
height = 0.3m



Area A = 0.4 x 0.2 = 0.08
Area B = 0.4 x 0.3 = 0.12
Area C = 0.2 x 0.3 = 0.06

Smallest pressure → biggest area
Biggest pressure → smallest area

a) smallest pressure: $\frac{\text{Force}}{\text{biggest area}} = \frac{1200}{0.12}$

$$= 10000 \text{ N/m}^2$$

b) Biggest pressure: $\frac{\text{Force}}{\text{smallest area}} = \frac{1200}{0.06}$

$$= 20,000 \text{ N/m}^2$$

Question 2)

$$P = \frac{F}{A}$$

$$F = P \times A$$

$$F = 500 \times 0.1875$$

$$F = 93.75 \text{ N}$$

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Question 3)

Pressure = density \times gravity \times depth

G = 9.81

$$10^3 \text{ kg/m}^3 \times 9.81 \text{ m/s}^2 \times 2.5 \text{ m}$$

$$10^3 \times 9.81 \times 2.5$$

$$\text{Pressure} = 1000 \times 9.81 \times 2.5$$

$$24525 \text{ PA}$$

$$24525 \text{ KPA}$$

Question 4) Density meter Gravity

$$895 \text{ kg/m}^3 \quad 1.75 \text{ m} \quad 9.81$$

$$895 \times 1.75 \times 9.81$$

$$P = 15364.9125 \text{ N/m}^2$$

$$15364.9125 \text{ PA}$$

$$15364.9125 \text{ KPA}$$

Question 5) Density Pressure Gravity

$$10^3 \text{ kg/m}^3 \quad 1.5 \times 10^4 \text{ Pa} \quad 9.81$$

$$15000 = 10^3 \times 9.81 \times h$$

$$15000 = 9810 \times h$$

$$h = \frac{15000}{9810}$$

$$h = 1.529 \text{ m}$$

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Question 6)

$$\text{mass} = 80 \text{ kg}$$

$$\begin{array}{l} \text{area of 1 foot} = 8 \text{ cm}^2 \\ \text{2 feet} \rightarrow 16 \text{ cm}^2 \end{array}$$

$$\text{mass} \times \text{gravity} = \text{Gravitational force}$$

$$80 \times 9.81 = 784.8 \text{ N}$$

$$\begin{array}{l} \text{1 cm} \times \text{1 cm} = \frac{16}{10000} \\ \text{2 cm} \times \text{2 cm} \\ = 0.0016 \text{ m}^2 \end{array}$$

$$P = \frac{F}{a}$$

$$P = \frac{784.8}{0.0016}$$

$$P = 490500 \text{ Pa}$$