

س ۱:	نسبت جرم به حجم را چگالی گویند.
س ۲:	$V = 0.1 \times 0.1 \times 0.2 = 0.002 \text{ m}^3$ $v = \frac{V}{m} \rightarrow v = \frac{0.002}{1} = 0.002 \frac{\text{m}^3}{\text{kg}}$ $P = \frac{F}{A} = \frac{mg}{A} \rightarrow P = \frac{1 \times 10}{0.1 \times 0.2} = 500 \text{ Pa}$
س ۳:	$P = \rho gh$ $P = 0.9 \text{ atm} = 0.9 \times (100 \text{ kPa}) = 90 \text{ kPa} = 90 \times 10^3 \text{ Pa}$ $90 \times 10^3 = 13534 \times 10 \times h \rightarrow h = \frac{90 \times 10^3}{13534 \times 10} = 0.66 \text{ m}$
س ۴:	a) $\left. \begin{array}{l} T = 125^\circ \text{C}, P = 125 \text{ kPa} \\ T = 125^\circ \text{C} \xrightarrow{\text{table}} P_{\text{sat}} = 232.1 \text{ kPa} \end{array} \right\} \rightarrow P < P_{\text{sat}} \rightarrow \text{ناحیه مافوق گرم}$ b) $\left. \begin{array}{l} T = 145^\circ \text{C}, v = 0.440 \text{ m}^3 / \text{kg} \\ T = 145^\circ \text{C} \xrightarrow{\text{table}} \left\{ \begin{array}{l} v_f = 0.001085 \text{ m}^3 / \text{kg} \\ v_g = 0.44632 \text{ m}^3 / \text{kg} \end{array} \right\} \end{array} \right\} \rightarrow v_f < v < v_g \rightarrow \text{ناحیه دوفازی}$
س ۵:	$v = v_f + x v_{fg} \rightarrow v = (0.001070) + (0.5 \times 0.66744) = 0.33479 \frac{\text{m}^3}{\text{kg}}$
س ۶:	$T (\text{K}) = T (^\circ \text{C}) + 273 \rightarrow T (\text{K}) = (-30) + 273 = 243 \text{ K}$ $PV = nRT \rightarrow n = \frac{PV}{RT} \rightarrow n = \frac{4 \times 100}{0.0821 \times 243} = 20.5$

س ۱:

نسبت حجم به جرم را حجم مخصوص گویند.

س ۲:

$$V = 0.1 \times 0.1 \times 0.2 = 0.002 \text{ m}^3$$

$$\rho = \frac{m}{V} \rightarrow v = \frac{1}{0.002} = 500 \frac{\text{kg}}{\text{m}^3}$$

$$P = \frac{F}{A} = \frac{mg}{A} \rightarrow P = \frac{1 \times 10}{0.1 \times 0.1} = 1000 \text{ Pa}$$

س ۳:

$$P = \rho gh$$

$$P = 0.95 \text{ atm} = 0.95 \times (100 \text{ kPa}) = 95 \text{ kPa} = 95 \times 10^3 \text{ Pa}$$

$$95 \times 10^3 = 13534 \times 10 \times h \rightarrow h = \frac{95 \times 10^3}{13534 \times 10} = 0.70 \text{ m}$$

س ۴:

$$\text{a) } \left. \begin{array}{l} T = 125^\circ \text{C}, P = 125 \text{ kPa} \\ T = 125^\circ \text{C} \xrightarrow{\text{table}} P_{\text{sat}} = 232.1 \text{ kPa} \end{array} \right\} \rightarrow P < P_{\text{sat}} \rightarrow \text{ناحیه مافوق گرم}$$

$$\text{b) } \left. \begin{array}{l} T = 145^\circ \text{C}, v = 0.450 \text{ m}^3 / \text{kg} \\ T = 145^\circ \text{C} \xrightarrow{\text{table}} \left\{ \begin{array}{l} v_f = 0.001085 \text{ m}^3 / \text{kg} \\ v_g = 0.44632 \text{ m}^3 / \text{kg} \end{array} \right\} \end{array} \right\} \rightarrow v > v_g \rightarrow \text{ناحیه مافوق گرم}$$

س ۵:

$$v = v_f + x v_{fg} \rightarrow v = (0.001090) + (0.5 \times 0.39169) = 0.196935 \frac{\text{m}^3}{\text{kg}}$$

س ۶:

$$T (\text{K}) = T (^\circ \text{C}) + 273 \rightarrow T (\text{K}) = (-30) + 273 = 243 \text{ K}$$

$$PV = nRT \rightarrow n = \frac{PV}{RT} \rightarrow n = \frac{(400 \times 10^3) \times 0.1}{8.314 \times 243} = 19.79$$