Homework

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1 Question 1

1.0 Definitions

$$T_p = 25°C$$
$$T_w = 100°C$$
$$\boxed{\Delta T = T_w - T_p = 75°C}$$
$$m_p = 0.7kg$$
$$m_w = 2kg$$
$$\boxed{m_{tot} = m_p + m_w = 2.7kg}$$

1.1 A

$$E_{H,p} = 0.7 * 910 * (25 + T) = 637(25 + T) = 15,925 + 637T$$
$$E_{H,w} = 2 * 4200 * (100 - T) = 8400(100 - T) = 840,000 - 8400T$$
$$15,925 + 637T = 840,000 - 8400T$$
$$9037T = 824,075$$
$$\boxed{T \approx 91.2}$$

1.2 B

$$T_{w,now} = 91.2$$
$$T_{w,fin} = 100$$
$$\Delta T = T_{w,fin} - T_{w,now} = 8.8$$
$$C = 2257$$
$$E_{H,need} = 2 * C * \Delta T = 2 * 2257 * 8.8$$
$$\boxed{E_{H,need} = 39,723.2J}$$