Part B (Problems) (answer Questions using Notes + Readings)

(2.1) Unit EER = 7.8 (advertised)

Cooling Capacity = 9500 Btu/hr

Power Input = 1560 watt

$$EER\,(actual) = \frac{9500\ Btu/hr}{1560\ watt} = 6.09$$

No this unit is not as efficient as advertised

(2.2.) COP = 3.5

$$Cooling\ Capacity = 20.7\ Tons \times \frac{12{,}000\ Btuh}{1\ Ton} = 248{,}400\ Btu/hr$$

$$COP = \frac{Cooling\ Capacity\ (Btuh)}{Power\ Input\ (Btuh)}$$

$$Power\ Input\ (Btuh) = \frac{Cooling\ Cap.\ (Btuh)}{COP} = \frac{248{,}400\ Btuh}{3.5}$$

Power Input (Btuh) = 70,971 Btuh

$$Power\ Input\ KW = 70{,}971\ Btuh \times \frac{1\ KW}{3410\ Btuh}$$

→ = 20.8 kw

(2.3) $$EER = \frac{Cooling\ Cap.\ (Btuh)}{Power\ Input\ (watts)} = \frac{248{,}400\ Btuh}{20{,}800\ watt}$$

→ = 11.94

(2.4) 34 Tons
COP = 3.6

$$Power\ Input = \frac{Cooling\ Cap\ (Btuh)}{COP}$$

$$Power\ Input\ (Btuh) = \frac{\left(34\ Tons \times \frac{12{,}000\ Btuh}{1\ Ton}\right)}{3.6} = 113{,}333\ Btuh$$

$$Power\ Input\ (KW) = 113{,}333\ Btuh \times \frac{KW}{3410\ Btuh} = 33.2\ KW$$