

Part IIB, Module 4A13
2009 Answer Sheet

1. -

2. -

3. -

(a) -

$$(b) W_{12} = \frac{P_i V_m}{\gamma - 1} \left(1 - \left(\frac{V_m}{V_c} \right)^{\gamma-1} \right), W_{34} = \frac{P_3 V_c}{\gamma - 1} \left(1 - \left(\frac{V_c}{V_m} \right)^{\gamma-1} \right)$$

(c) $p_3 = 32.7$ bar, $\text{gimep} = 4.0$ bar

(d) $W_{\text{pump}} = 0.44V_m$, $\text{net imep} = 3.5$ bar

(e) -