

**Paper 3A3 2003. Answers.**

- Q1 b) i  $m = 44.9 \text{ kg/sec.}$   
b) ii  $C_f = 0.0065$   
b) iii  $M_1 = 0.25, P_{o1} = 235 \text{ kPa.}$
- Q2 b) i  $V/a_1 = -0.647$   
b) ii  $P = 24.7 \text{ kPa}$
- Q3) b) i  $M_c = 0.41, m = 4.29 \text{ kg/s, } A_c = 0.02 \text{ m}^2.$   
b) ii  $M = 1.88, A = 0.0153 \text{ m}^2.$   
b) iii  $F = 807 \text{ N}$  acting upstream.
- Q4) b)  $M = 1.535, \theta = 5.96^\circ.$
- Q6) b)  $m = 128.9 \text{ kJ/kg. } P_{o2}/P_{o1} = 2.91.$
- Q7) c)  $v \Delta t / \Delta y^2 < 0.5.$   
e)  $v \Delta t / \Delta y^2 < 0.25.$
- Q8) a) i  $22.2^\circ, 187.9 \text{ kJ/kg.}$   
a) ii  $41.25\%$   
a) iii  $P_{o4}/P_{o3} = 0.55$   
b) i  $6 \text{ stages.}$   
b) ii  $P_1 = 0.882 \text{ bar, } P_{o1rel} = 1.235 \text{ bar, } \Delta P_{orel} = 0.014 \text{ bar.}$