

2009 IIA 3D5 WATER ENGINEERING

List of Numerical Answers

- Q1. (a) 0 in the first hour, and 7.3 mm in the second hour
(b) $11.7 \text{ m}^3 \text{ s}^{-1}$ during the fifth hour
(d) $1.44 \text{ m}^3 \text{ s}^{-1}$

- Q2. (a) Subcritical

(b) $h_1 = \sqrt[3]{\frac{q^2}{3g}}$

- (c) 2.53 hours

- Q3. (a) (i) 0.016 m (ii) $0.045 \text{ kg m}^{-1} \text{ s}^{-1}$
(b) (i) 0.512 kg m^{-3} (ii) 0.012 kg m^{-3}

- Q4. (c) $H = 17.5 \text{ m}$, $Q = 28.0 \text{ l s}^{-1}$, $P = 6.76 \text{ kW}$