

4A10, 2010, Answers

Q1

(a) –

(b) $k = (U^2 \rho_1 \rho_2) / (4\sigma(\rho_1 + \rho_2))$

(c) –

Q2 –

Q3

(a) $\omega^2 = k/m$, masses moving in same direction; $\omega^2 = 3k/m$, masses moving in opposite direction.

(b) –

(c) fluid density less than 2% of the solid density.

(d) –

(e) $d = 2\pi U St/\omega$

Q4

(a) –

(b) –

(c) $\max(S_{uu}) = 0.8057 \text{ m}^2\text{s}^{-1}$

(d) $|H_{UF}|^2 = 35160 \text{ N}^2\text{m}^{-1}\text{s}^2$

(e) $\max(S_{xx}) = 0.00034787 \text{ m}^2\text{s}$