

## 4F1 2010 — Answers

1(a) Spec. A implies  $K(0) \geq 100$ . (b)  $\omega_1 \leq 13.49$  rad/sec.

2(a)(ii)  $G(s)$  has a zero at  $s = 0$  but no other zeros in the right half-plane.

(c)(ii)  $K(s) = \frac{1+s}{1-s}$  is one possibility.

3(b)(i) Initial slope of step response:

$$\frac{\prod_{i=1}^{n-1} \alpha_i}{\prod_{i=1}^n \beta_i}$$

(c)(i) Initial slope of step response: 0. Derivative of initial slope of step response: 1.

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