
Exam

Control Engineering

FCHPT STU in Bratislava

19.8.2006

Answers

Problem 1. The step response function of the process described by the differential equation $9y''(t) + 36y'(t) + 36y(t) = 1u(t)$ is

- ☐ $\frac{5}{36} - \frac{5}{36}e^{-2t} - \frac{5}{18}e^{-2t}t$
☐ $1/18 - 1/18e^{-2t} - 1/9e^{-2t}t$
☐ no other response is correct
☐ $1/36 + \frac{107}{36}e^{-2t} + \frac{107}{18}e^{-2t}t$
☒ $1/36 - 1/36e^{-2t} - 1/18e^{-2t}t$

3

Problem 2. Critical gain of a P controller in closed-loop with controlled system described by transfer function $G_p(s) = \frac{9}{s^3 + 7s^2 + 9s + 7}$ je

- ☒ 6.22
☐ 1.43
☐ no other response is correct
☐ -1.06
☐ 22.13

2