

EE409 FINAL EXAM.
CLOSED BOOKS AND NOTES
2 PAGES 8 1/2" x 11"

52010
5/18/10

5:00 - 6:50 P.M

TOTAL POINTS 55

Q1 SOLVE THE DIFF. EQUATION

25

$$\left(1 - \frac{s^{-2}}{9}\right) y_k = \begin{cases} \left(\frac{1}{3}\right)^k & k \geq 0 \\ 0 & k < 0 \end{cases}$$

WITH I.C = 0 = $\boxed{\begin{matrix} y(0) = 0 \\ y(1) = 0 \end{matrix}}$ Not $\begin{matrix} y(-1) = 0 \\ y(-2) = 0 \end{matrix}$
 for $y(k)$, $h(k)$.

Q2 FOR THE FOLLOWING SYSTEM

$$\begin{aligned} \dot{x}_1(t) &= \frac{3}{4} x_1(t) + u_1(t) \\ \dot{x}_2(t) &= \frac{1}{2} x_1(t) + \frac{1}{2} x_2(t) + u_2(t) \end{aligned}$$

(20)

$$y(t) = x_1(t)$$

- (a) FIND A, B, C, D
- (b) FIND e^{At} .
- (c) MATRIX $(j\omega I - A)^{-1}$

Q3 FOR WHAT VALUE OF g THE SYSTEM IS STABLE

(10)

Not stable!

