<u>م</u>	بسم الله الرحيد
Automatic Control	Closed Book Exam
MENG366	Time 1 ¹ / ₂ hrs
Second Exam	Wednesday: 11/9/1424 H
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Student N	Name:							Number	 •
Q1:	/10	Q2:	/10	Q3:	/10	Q4:	/10	Total:	/40

1. The unity feedback positional servo system with PD-Control is given. What is the type of the system? Find positional error, velocity error and acceleration error constants and corresponding steady state errors of the system.



2. The mechanical system has a mass of 1kg, stiffness of 40 N/m and damping coefficient of 4 Ns/m. If the external force is $f(t) = 12\delta(t)$. Find the response x(t).



3. For the following closed loop control system; overshoot should not exceed 10% and peak time should be less than or equal 0.4s. Find K_1 and K_2 gain values that will satisfy the conditions. What is the settling time of the system if 2% error is assumed.



4. Plot the root loci for the system given. What is the value of K, if roots are equal to $s_{1,2} = -2 \mp 2j$.

