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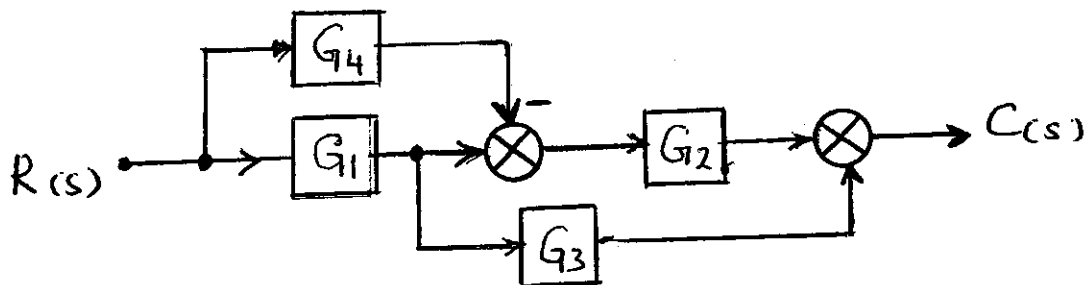
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(Equally Distributed Marks)

Q1: Classify and solve the D.E given by

$$y'' + 3y' - 4y = 8 \quad ; \quad y(0) = y'(0) = 0$$

Q2: Find The transfer function $C(s)/R(s)$ for the system shown below



Q3: Construct the root Locus plot for the system given by :

$$G(s) = \frac{10K(S+1)(S+2)}{S^2(S-1)(S-2)} \quad ; \quad H(s)=1$$

Find the range for stable operation.

Q4: For a unity F.B.C.S. $G(s) = \frac{K}{S(SJ+B)}$, if $\xi = 0.7$

And $\omega_n = 5 \text{ rad/sec}$.Find: t_p , ω_d , t_s and M_p

Then evaluate K , J and B .



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Q1:(a) Prove that the natural frequency for pendulum

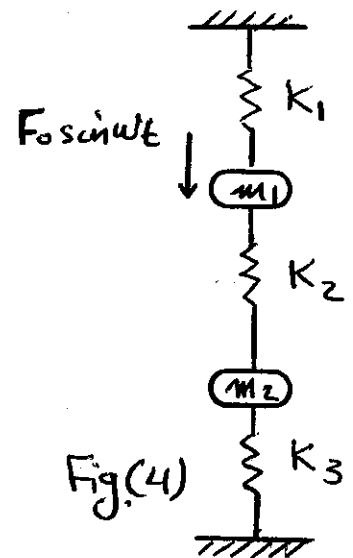
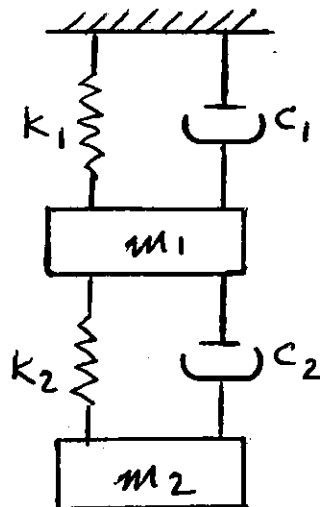
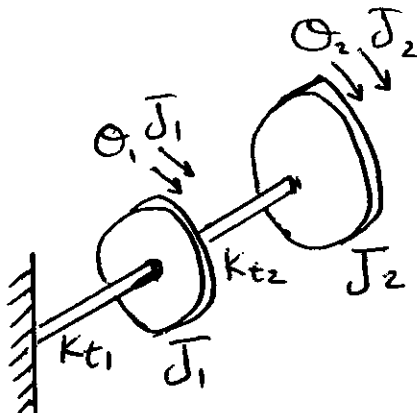
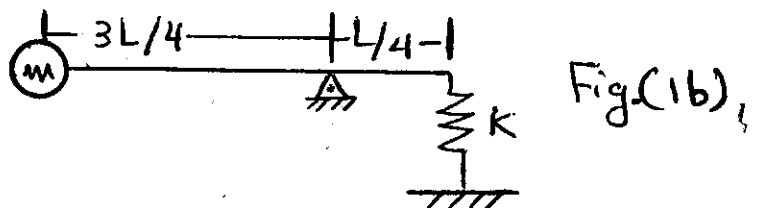
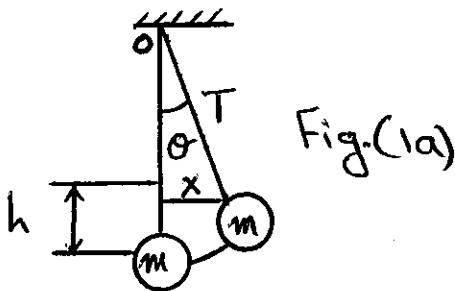
$$\omega_n = \sqrt{g/L} \quad \text{in fig(1a)}$$

$$\omega_n = \sqrt{K/9m} \quad \text{in fig (1b)}$$

Q2: find the natural frequency and mode shape for the system shown in fig. (2)

Q3: write the equation of motion only for the damping system shown in fig. (3)

Q4. The forced vibration system shown in fig.(4) Find the steady state Response using crammers' rules.



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