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Unit 2 - Week 1

Assignment - 1

The due date for submitting this assignment has passed. **Due on 2016-08-06, 23:30 IST.**

Submitted assignment

1) A critically damped shock absorber is to be design for a motorcycle of mass 200 kg. When the shock absorber is subjected to an initial vertical velocity due to a road bump, the resulting relaxation time is found 2 sec. Find the necessary stiffness of the shock absorber. ***2 points***

- (a) 50 N/m
- (b) 48 N/m
- (c) 52 N/m
- (d) 60 N/m

No, the answer is incorrect.
Score: 0

Accepted Answers:
(a) 50 N/m

2) A piano string is 1.10 m long and has a mass of 9.00 g. How much tension must the string be under if it is to vibrate at a fundamental frequency of 135 Hz? ***2 points***

- (a) Range of 60 to 65 Newton
- (b) Range of 66 to 70 Newton
- (c) Range of 71 to 75 Newton
- (d) Range of 76 to 80 Newton

No, the answer is incorrect.
Score: 0

Accepted Answers:
(c) Range of 71 to 75 Newton

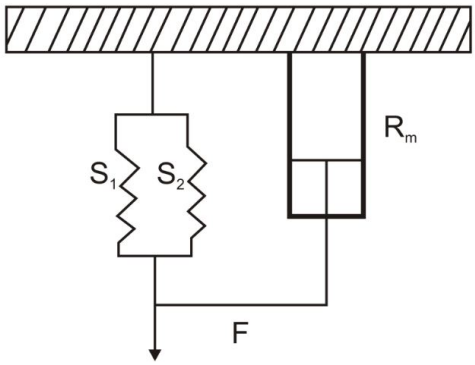
3) The human leg has a measured natural frequency of around 20 Hz when in its rigid (knee locked) position, in the longitudinal direction (i.e., along the length of the bone) assuming no damping. What will be the maximum displacement of the leg? At t=0 the initial speed u_0=0.06 m/s and displacement x_0=0. ***2 points***

- (a) Range of 0.0001 mtr. to 0.0005 mtr.
- (b) Range of 0.001 mtr. to 0.005 mtr.
- (c) Range of 0.006 mtr. to 0.008 mtr.
- (d)Range of 0.009 mtr. to 0.03 mtr.

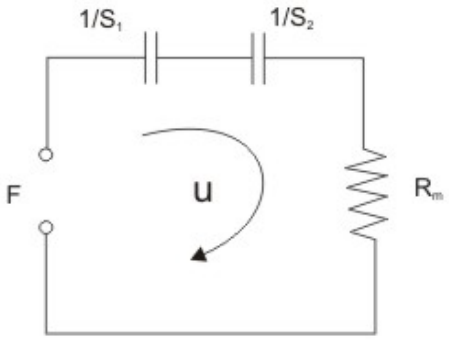
No, the answer is incorrect.
Score: 0

Accepted Answers:
(a) Range of 0.0001 mtr. to 0.0005 mtr.

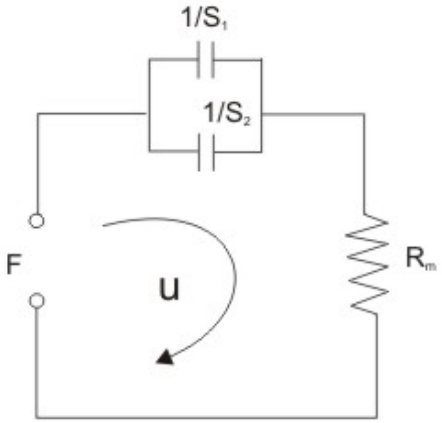
4) Draw the equivalent electrical circuit for the following mechanical system and find the mechanical impedance with its corresponding unit, where R_m=1.4 kg/s, S_1=30 N/m, S_2=70 N/m and F=2N. **2 points**



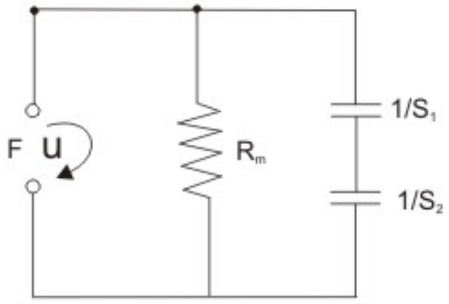
(a)



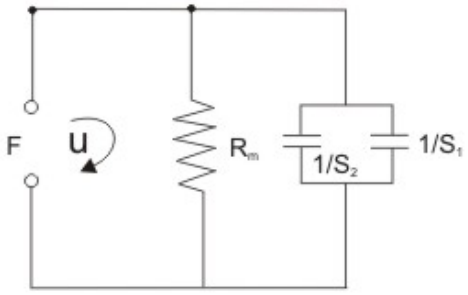
(b)



(c)

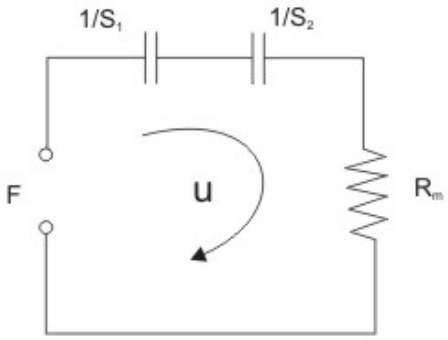


(d)



No, the answer is incorrect.
Score: 0

Accepted Answers:
(a)



5) Consider a mass-spring system described by the equation (1) Give the value(s) of s for which the system is critically damped. ***2 points***

$$6\frac{d^2x}{dt^2}+8\frac{dx}{dt}+sx=0 \quad (1)$$

(a) 1.75 N/m
(b) 2.96 N/m
(c) 1.99 N/m
(d) 2.66 N/m

No, the answer is incorrect.
Score: 0

Accepted Answers:

(d) 2.66 N/m

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