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Courses » Audio System Engineering

Announcements Course Ask a Question Progress Mentor

Unit 2 - Week 1

Course outline

How to access the Portal ?

Week 1

- Lecture 01 : Introduction
- Lecture 02 : Fundamentals of Linear Vibrations
- Lecture 03 : Damped Oscillation and Forced Oscillation
- Lecture 04 : Equivalent Electrical Circuits for Oscillation
- Lecture 05 : Tutorial I
- Assignment 1 Solution
- Quiz : Assignment - 1

Week-2:

Week 3

Week 4:

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 **2 points** 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.

- (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 **2 points** be under if it is to vibrate at a fundamental frequency of 135 Hz?

- (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 **2 points** 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 $x_0=0$.

- (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.

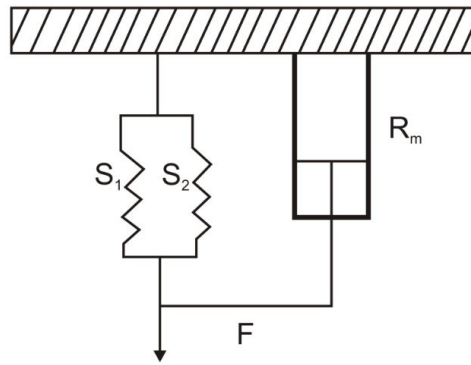
No, the answer is incorrect.

Score: 0

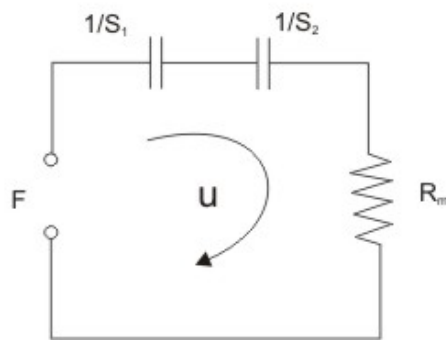
Accepted Answers:

(a) Range of 0.0001 mtr. to 0.0005 mtr.

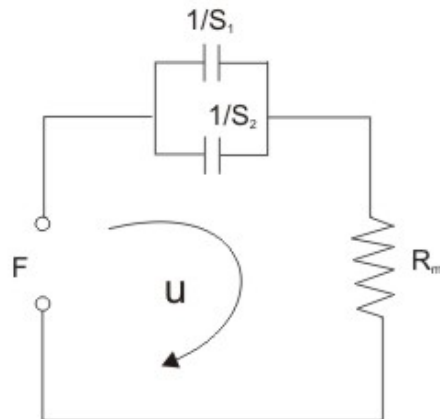
4) Draw the equivalent electrical circuit for the following mechanical **2 points** system and find the mechanical impedance with its corresponding unit, where $R_m=1.4 \text{ kg/s}$, $S_1=30 \text{ N/m}$, $S_2=70 \text{ N/m}$ and $F=2\text{N}$.



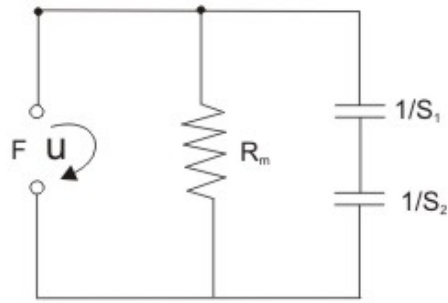
(a)



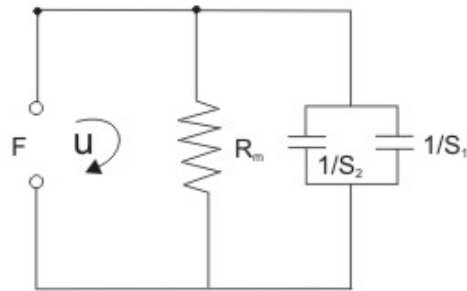
(b)



(c)



(d)

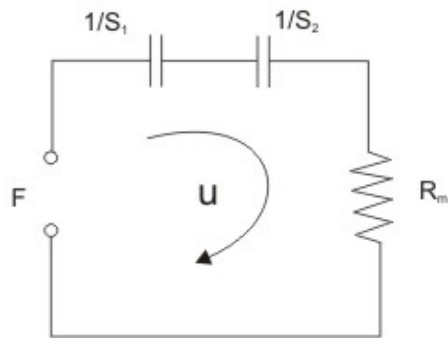


No, the answer is incorrect.

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

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

- (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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