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Courses » Introduction to Mechanical Vibration Announcements **Course** Ask a Question Progress



Unit 2 - Week 1

Course outline

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Week 1

- Lesson 1 - Introduction
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Week 2

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Week 1 Assignment

The due date for submitting this assignment has passed. **Due on 2018-02-21, 23:59 IST**
As per our records you have not submitted this assignment.

This assignment contains 15 questions, 5 questions of 1 mark each and 10 questions of 2 marks each. Full marks are 25.

1) The number of degrees of freedom of a simple pendulum is 1 point

- 0
- 1
- 2
- 3

No, the answer is incorrect.

Score: 0

Accepted Answers:

1

2) Two springs having stiffness 10N/mm and 5 N/mm are attached in series and a mass is suspended at the end of it. The equivalent spring stiffness of the two springs is nearly 1 point

- 0.3 N/mm
- 3.3 N/mm
- 5 N/mm
- 15 N/mm

No, the answer is incorrect.

Score: 0

Accepted Answers:

3.3 N/mm

3) The spring constant of a simply supported beam having length (L), modulus of elasticity (E) and area moment of inertia (I) subjected to load W at mid-point is 1 point

- $(48EI)/L^3$
- $(8EI)/L^3$
- $L^3/48EI$
- $3EI/L^3$

No, the answer is incorrect.

Score: 0

Week 8

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Accepted Answers:

$(48EI)/L^3$

4) A harmonic motion is given by $x(t) = 10\sin(30t - \pi/3)$ mm. where t is in second and phase angle is in radian. What will be the time period of motion? **1 point**

- 1.209 Second
 0.209 Second
 0.409 Second
 0.902 Second

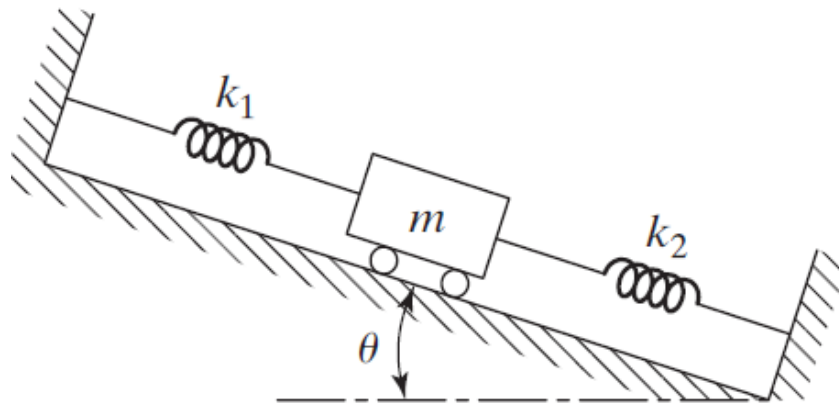
No, the answer is incorrect.**Score: 0****Accepted Answers:***0.209 Second*

5) When a vibrating system slide on a dry surface, the damping is

- viscous
 coulomb
 solid
 none

No, the answer is incorrect.**Score: 0****Accepted Answers:***coulomb*

6) Determine the equivalent stiffness of the system shown in the figure **2 points** below. Given: - $k_1 = 10$ N/mm and $k_2 = 15$ N/mm



- 15 N/mm
 6 N/mm
 25 N/mm
 7 N/mm

No, the answer is incorrect.**Score: 0****Accepted Answers:***25 N/mm*

7) In Fourier series expansion, $F(t) = \frac{a_0}{2} + \sum_{n=1}^{\infty} (a_n \cos(n\omega t) + b_n \sin(n\omega t))$, a_n will be zero for function and b_n will be zero forfunction. **2 points**

- odd, odd
 odd, even
 even, odd

- even, even

No, the answer is incorrect.

Score: 0

Accepted Answers:

odd, even

8) A body describes simultaneously two motions, $x_1 = 3 \sin 40t$, $x_2 = 4 \sin 41t$ What is the maximum and minimum amplitude of the combined motion and what is the beat frequency? **2 points**

- 7, 2 and $1/3\pi$ Hz
 5, 3 and $2/\pi$ Hz
 7, 1 and $1/2\pi$ Hz
 3, 5 and $1/3\pi$ Hz

No, the answer is incorrect.

Score: 0

Accepted Answers:

7, 1 and $1/2\pi$ Hz

9) Determine the torsional stiffness of the shaft ($G = 210$ GPa) of length 1.5 m having internal and external radius 15 mm and 30 mm respectively. **2 points**

- 134 kN-m/rad
 89 kN-m/rad
 60 kN-m/rad
 167 kN-m/rad

No, the answer is incorrect.

Score: 0

Accepted Answers:

167 kN-m/rad

10) If there is a non-zero number y such that, $\vartheta(t + y) = \vartheta(t)$ then the type of motion is $\vartheta(t)$ **2 points**

- periodic
 aperiodic
 harmonic
 none

No, the answer is incorrect.

Score: 0

Accepted Answers:

periodic

11) A cantilever beam, which is made of an alloy with Young's modulus of elasticity $E = 72 \times (10)^9$ N/m², is loaded transversely at its free end. If the length of the beam is 750 mm and the beam has an annular cross-section with inner and outer diameters of 110 mm and 120 mm, respectively, then determine the equivalent stiffness (in N/m) of this beam. **2 points**

- $1.531 \times (10)^6$
 $3.06 \times (10)^6$
 $2 \times (10)^6$
 $4 \times (10)^6$



No, the answer is incorrect.

Score: 0

Accepted Answers:

$$1.531 \times (10)^6$$

12 Find the equivalent spring constant of the system shown in figure below. 2 points

 W1Q12

- 9/10k
- 10k/9
- 11/9k
- 9/11k

No, the answer is incorrect.

Score: 0

Accepted Answers:

$$10k/9$$

13 What is the resultant motion response, three harmonic motions which are given below? 2 points

$$x_1 = a \sin \omega t, x_2 = a \sin(\omega t + 2\pi/3), x_3 = a \sin(\omega t + 4\pi/3)$$

- 4
- 6
- 0
- 8

No, the answer is incorrect.

Score: 0

Accepted Answers:

$$0$$

14 The maximum displacement and acceleration of the foundation of a centrifugal pump was found to be $x_m = 0.25 \text{ mm}$ and $\ddot{x}_m = 0.4 \text{ g}$. Find the operating speed (in rpm) of the pump. 0 points

- 9.536
- 15.675
- 29
- 19.935

No, the answer is incorrect.

Score: 0

Accepted Answers:

$$19.935$$

15 A harmonic motion has an amplitude of 0.05 m and a frequency of 10 Hz. What are its period, maximum velocity, and maximum acceleration 2 points

- 0.1 sec, 3.146 m/sec, 197.393 m/sec²
- 0.2 sec, 2.24 m/sec, 187.5 m/sec²
- 0.3 sec, 4.67 m/sec, 278.5 m/sec²
- 0.4 sec, 3.146 m/sec, 194.5 m/sec²

No, the answer is incorrect.

Score: 0

Accepted Answers:

$$0.1 \text{ sec}, 3.146 \text{ m/sec}, 197.393 \text{ m/sec}^2$$

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