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Courses » Machinery Fault Diagnosis And Signal Processing

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Unit 4 - Week 2

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Course outline

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 Lecture 6 :Basics of Vibration Lecture 7 : Free and Forced Response Lecture 8 : Vibration and Shock Isolation Lecture 9 : Rotordynamics Lecture 10 : Practical Examples of Vibration Week 2 : Lecture Materials Quiz : Assignment 2 Feedback for Week 2

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Assignment 2

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2019-02-13, 23:59 IST1) The natural frequency of a mechanical system increases with 1 point

- a. Increase in stiffness
- b. decrease in mass
- c. Both a. and b.
- d. Does not depend on stiffness and mass

 (a) (b) (c) (d)**No, the answer is incorrect.****Score: 0****Accepted Answers:**

(c)

2) 1 point

If the characteristic roots of the equation of motion for a single degree of freedom spring-damper system are real and equal, the system response will be

- a. Stable
- b. Unstable
- c. Asymptotically stable
- d. Cannot be determined

 (a) (b) (c) (d)**No, the answer is incorrect.****Score: 0****Accepted Answers:**

(a)

3) 1 point

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Solution

The torsional stiffness of a shaft of length l , rigidity modulus G and polar moment of inertia given by

- a. $\frac{Gl}{J}$
- b. $\frac{GJ}{l}$
- c. $\frac{lJ}{G}$
- d. None of these

- (a)
- (b)
- (c)
- (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(b)

4)

1 point

The amplitude of an undamped single degree of freedom system subjected to an initial displacement, x_0 and zero initial velocity, is given by

- a. $\frac{x_0}{\omega_n}$
- b. ω_n
- c. x_0
- d. Data insufficient

- (a)
- (b)
- (c)
- (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(c)

5) At resonance, the amplitude of the undamped vibratory system increases

1 point

- a. Linearly
- b. Quadratically
- c. Exponentially
- d. Does not increase

- (a)
- (b)
- (c)
- (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(a)

6)

1 point

For a rotating machine, the forcing frequency due to rotating unbalance corresponds to its

- a. Unbalance mass
- b. Rotational speed
- c. Eccentricity
- d. Cannot be determined

- (a)
- (b)
- (c)
- (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(b)

7)

1 point

An unbalance force of magnitude $200\sin(10t)$ N is transmitted to the base through a damper stiffness 1000 N/m and damping factor 0.5. What is the magnitude of force transmitted to base, if the mass of machine is 10 kg?

- a. 100 N
- b. 141 N
- c. 282 N
- d. 200 N

- (a)
- (b)
- (c)
- (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(c)

8)

1 point

For a primary vibrating system with stiffness of 1000 N/m and mass of 10 kg, the designed tuned mass damper should have a natural frequency of

- a. 200 rad/s
- b. 10 rad/s
- c. 14.14 rad/s
- d. 2.25 rad/s

- (a)
- (b)
- (c)
- (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(b)

9) Mobility is defined as

1 point

- a. Velocity/Force
- b. Force/Velocity
- c. Displacement/Force
- d. Force/Displacement

- (a)
- (b)
- (c)
- (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(a)

10)

1 point

The response of a single degree of freedom (SDOF) damped free vibrating system is

- a. Transient in nature
- b. Steady state in nature
- c. Random
- d. None

- (a)
- (b)
- (c)
- (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(a)

11)

1 point

If damping factor at resonance is 0.5, what is the value of Magnification factor?

- a. 0
- b. 0.5
- c. 1
- d. 2

- (a)
- (b)
- (c)
- (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(c)

12)

1 point

If the characteristic roots of the single degree of freedom spring mass damper system have positive roots, the system response will be:

- a. Stable
- b. Unstable
- c. Asymptotically stable
- d. Cannot be determined

- (a)
- (b)
- (c)
- (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(b)

13) At resonance, the forcing frequency is same as natural frequency

1 point

- a. True
- b. False

- (a)
- (b)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(a)

14)

1 point

Two springs have stiffnesses of 1000 N/m and 1500 N/m. What is the equivalent stiffness if are connected in series?

- a. 3500 N/m
- b. 600 N/m
- c. 1000 N/m
- d. 800 N/m

- (a)
- (b)
- (c)
- (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(b)

15)

1 point

The differential equation of motion of a single degree of freedom forced vibrating system is type of

- a. Homogeneous equation
- b. Non-homogeneous equation
- c. Depends on the type of force
- d. None of these

- (a)
- (b)
- (c)
- (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(b)

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