

Unit 5 - Week 3

Course outline

How does an NPTEL online course work?

Week 0

Week 1

Week 2

Week 3

- Classical Mechanics: L15: Matrices and all that
- Classical Mechanics: L16: Matrices, Forms, and all that
- Classical Mechanics: L17: Principal axis transformation
- Classical Mechanics: L18: Small Oscillations
- Classical Mechanics: L19: Oscillations, Normal Coordinates
- Classical Mechanics: L20: Oscillations, Triatomic molecule
- Quiz : Assignment 3

Week 3 Feedback Form : Introduction to Classical Mechanics

Week 4

Week 5

Week 6

Week 7

Week 8

Week 9

Week 10

Week 11

Week 12

Live session

Video Download

Assignment 3

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

Due on 2020-10-07, 23:59 IST.

1) Which one of the following matrices is NOT a positive definite matrix? 4 points

$$\begin{pmatrix} 1 & -1 \\ -1 & 2 \end{pmatrix}$$

$$\begin{pmatrix} 1 & 3 \\ 3 & 10 \end{pmatrix}$$

$$\begin{pmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{pmatrix}$$

$$\begin{pmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & -1 \end{pmatrix}$$

No, the answer is incorrect.
Score: 0

Accepted Answers:

$$\begin{pmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & -1 \end{pmatrix}$$

2) The potential energy of a particle of mass m is given by 4 points
 $U(x) = a \sin(k^2x - \pi/2), a > 0, k^2 > 0.$

The angular frequency of small oscillations of the particle about $x = 0$ is

$$k^2 \sqrt{\frac{2a}{m}}$$

$$k^2 \sqrt{\frac{a}{m}}$$

$$k^2 \sqrt{\frac{a}{2m}}$$

$$2k^2 \sqrt{\frac{a}{m}}$$

No, the answer is incorrect.
Score: 0

Accepted Answers:

$$k^2 \sqrt{\frac{a}{m}}$$

3) Which of the following is a solution of $\frac{d^2u(x)}{dx^2} = k^2u(x)$, for k real? 2 points

$$e^{-kx}$$

$$\sin kx$$

$$\cos kx$$

$$\sin hx$$

No, the answer is incorrect.
Score: 0

Accepted Answers:

$$e^{-kx}$$