

Unit 3 - Week 1

Course outline

How does an NPTEL online course work?

Week 0

Week 1

● Classical Mechanics: L1: Introduction. Symmetries of space and time.

● Classical Mechanics: L2: Generalized coordinates and degrees of freedom

○ Classical Mechanics: L3: Virtual Work

○ Classical Mechanics: L4: Virtual Work (rigid body)

○ Classical Mechanics: L5: d'Alembert Principle

○ Classical Mechanics: L6: Euler Lagrange Equation for a holonomic system

○ Classical Mechanics: L7: Euler Lagrange Equations. Examples.

○ Quiz : Assignment 1

○ Week 1 Feedback Form : Introduction to Classical Mechanics

Week 2

Week 3

Week 4

Week 5

Week 6

Week 7

Week 8

Week 9

Week 10

Week 11

Week 12

Live session

Video Download

Assignment 1

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

Due on 2020-09-30, 23:59 IST.

1) How many degrees of freedom does a particle moving on a circle have ? 1 point

- 0
 1
 2
 3

No, the answer is incorrect.
Score: 0

Accepted Answers:
1

2) How many degrees of freedom does a particle have that is constrained to move on a sphere? 1 point

- 0
 1
 2
 3

No, the answer is incorrect.
Score: 0

Accepted Answers:
2

3) How many degrees of freedom does a di-atomic molecule have. Treat the atoms to be structureless points. 1 point

- 3
 4
 5
 6

No, the answer is incorrect.
Score: 0

Accepted Answers:
6

4) A surface is given by the equation $x + 2y + 3z = 0$. Which of the following vector is parallel to the normal to the surface. 1 point

- $\hat{x} + \hat{y} + \hat{z}$
 $\hat{x} - \hat{y} + \hat{z}$
 $\hat{x} + 2\hat{y} + 3\hat{z}$
 $\hat{x} + 3\hat{y} + 2\hat{z}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $\hat{x} + 2\hat{y} + 3\hat{z}$

5) What is the value of δ_{kk} where k runs from 1 to 3. Einstein summation convention is implied. 1 point

- 0
 1
 2
 3

No, the answer is incorrect.
Score: 0

Accepted Answers:
3

6) What is the value of $\delta_{jk}\delta_{jk}$ where j, k run from 1 to 3. Einstein summation convention is implied. 1 point

- 0
 1
 2
 3

No, the answer is incorrect.
Score: 0

Accepted Answers:
3

7) What is the value of $\epsilon_{ijk}\delta_{jk}$ where i, j, k run from 1 to 3. ϵ_{ijk} is the Levi-Civita anti-symmetric tensor. Einstein summation convention is implied. 1 point

- 0
 1
 2
 3

No, the answer is incorrect.
Score: 0

Accepted Answers:
0

8) If q_i are generalized coordinates, the $\partial q_i / \partial q_j$ is equal to 1 point

- 0
 1
 δ_{ij}
 $\epsilon_{ijk}\delta_{kt}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 δ_{ij}

9) If q_i represent generalized coordinates the $\partial(q_i q_j) / \partial q_k$ is 1 point

- $q_i \delta_{jk} + q_j \delta_{ik}$
 $q_k \delta_{ij} + q_j \delta_{ik}$
 $2q_i \delta_{jk} + 2q_j \delta_{ik}$
 $2q_k \delta_{ij} + 2q_j \delta_{ik}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $q_i \delta_{jk} + q_j \delta_{ik}$

10) If q_k are generalized coordinates, then $\partial(q_i q_i) / \partial q_k$ is equal to 1 point

- q_i
 $2q_i$
 q_k
 $2q_k$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $2q_k$