

Course outline

How does an NPTEL online course work?

Prerequisite Assignment

Week 1

Week 2

Week 3

Week 4

Week 5

- Problems with Holonomic and non- Holonomic Constraints, Variable Endpts - Part 01

- Problems with Holonomic and non- Holonomic Constraints, Variable Endpts - Part 02

- Problems with Holonomic and non- Holonomic Constraints, Variable Endpts - Part 03

- Problems with Holonomic and non- Holonomic Constraints, Variable Endpts - Part 04

- Problems with Holonomic and non- Holonomic Constraints, Variable Endpts - Part 05

- Problems with Holonomic and non- Holonomic Constraints, Variable Endpts - Part 06

- Variational Calculus and its applications in Control Theory and Nanomechanics : Week 5 Feedback Form

 Quiz : Assignment 5

Week 6

Week 7

Week 8

Week 9

Week 10

Week 11

Week 12

Download Videos

Text Transcripts

Live Session

Assignment 5

The due date for submitting this assignment has passed.

Due on 2021-02-24, 23:59 IST.

As per our records you have not submitted this assignment.

1) Minimize

1 point

$$I = \int_0^{x_1} [y^2 - (y')^2] dx$$

 with left end point fixed and $y(x_1)$ is along the curve

$$x_1 = \frac{\pi}{4}$$

$$y \equiv 0$$

$$y \equiv 1$$

$$y = x$$

$$y = x + 1$$

$$y = x^2 - 1$$

$$y = x^2 + 1$$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $y \equiv 0$

2) Find the extremals for

1 point

$$I = \int_0^1 \left[\frac{1}{2}(y')^2 + yy' + y' + y \right] dx$$

 where end values of y are free

$$y = -\frac{1}{2}x + \frac{2}{3} + \frac{1}{3}x^2$$

$$y = -\frac{1}{3}x + \frac{1}{2} + \frac{1}{2}x^2$$

$$y = \frac{3}{2}x + \frac{2}{3} - \frac{1}{2}x^2$$

$$y = -\frac{3}{2}x + \frac{1}{2} + \frac{1}{2}x^2$$

$$y = -\frac{1}{2}x + \frac{1}{2} + \frac{3}{2}x^2$$

$$y = \frac{3}{2}x + \frac{1}{3} + \frac{1}{3}x^2$$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $y = -\frac{3}{2}x + \frac{1}{2} + \frac{1}{2}x^2$

 3) Solve the Euler-Lagrange equation associated with $I = \int_a^b [y^2 - yy' + (y')^2] dx$

1 point

$$\text{arc cosh } \frac{x}{\sqrt{c_1}} + c_2 = \pm y$$

$$\text{arc cosh } \frac{y}{\sqrt{c_1}} + c_2 = \pm x$$

$$\text{arc sinh } \frac{x}{\sqrt{c_1}} + c_2 = \pm y$$

$$\text{arc sinh } \frac{y}{\sqrt{c_1}} + c_2 = \pm x$$

$$\text{arc tanh } \frac{x}{\sqrt{c_1}} + c_2 = \pm y$$

$$\text{arc tanh } \frac{y}{\sqrt{c_1}} + c_2 = \pm x$$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $\text{arc cosh } \frac{y}{\sqrt{c_1}} + c_2 = \pm x$