

## Course outline

How does an NPTEL online course work?

Prerequisite Assignment

Week 1

Week 2

Week 3

Week 4

Week 5

Week 6

Week 7

Week 8

● Noether's Theorem / Introduction to Second Variation - Part 01

● Noether's Theorem / Introduction to Second Variation - Part 02

● Noether's Theorem / Introduction to Second Variation - Part 03

● Noether's Theorem / Introduction to Second Variation - Part 04

● Noether's Theorem / Introduction to Second Variation - Part 05

● Noether's Theorem / Introduction to Second Variation - Part 06

○ Quiz : Assignment 8

● Variational Calculus and its applications in Control Theory and Nanomechanics : Week 8 Feedback Form

Week 9

Week 10

Week 11

Week 12

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# Assignment 8

The due date for submitting this assignment has passed.

**Due on 2021-03-17, 23:59 IST.**

As per our records you have not submitted this assignment.

1) Choose the extremal(s) of the functional

1 point

$$F(y) = \int_0^1 (y^2 + y'^2 + 2ye^x) dx, \quad y(0) = 0, \quad y(1) = 1$$

$$y = \left( \frac{1 - e/2}{\cosh 1} \right) \cosh x + \frac{1}{2} x e^x$$

$$y = \left( \frac{1 + e/2}{\cosh 1} \right) \cosh x + \frac{1}{2} x e^x$$

$$y = \left( \frac{1 - e/2}{\sinh 1} \right) \sinh x + \frac{1}{2} x e^x$$

$$y = \left( \frac{1 + e}{\sinh 1} \right) \sinh x + \frac{1}{2} x e^x$$

$$y = \left( \frac{1 + e/2}{\sinh 1} \right) \sinh x + \frac{1}{2} x e^x$$

$$y = \left( \frac{1 - e}{\sinh 1} \right) \sinh x + \frac{1}{2} x e^x$$

No, the answer is incorrect.

Score: 0

Accepted Answers:

$$y = \left( \frac{1 - e/2}{\sinh 1} \right) \sinh x + \frac{1}{2} x e^x$$

2) Choose the extremal(s) of the functional :

1 point

$$I = \int_{x_1}^{x_2} (x(y')^2 - yy' + y) dx$$

$$y = -\frac{c_1}{2x^2} + c_2$$

$$y = -\frac{c_1}{x^2} + c_2$$

$$y = \frac{c_1}{2} \ln|x| + c_2 x$$

$$y = \frac{c_1}{2} \ln|x| + \frac{c_2}{x}$$

$$y = -\frac{c_1}{x^2} + c_2 x$$

$$y = \frac{c_1}{2} \ln|x| + c_2$$

No, the answer is incorrect.

Score: 0

Accepted Answers:

$$y = \frac{c_1}{2} \ln|x| + c_2$$

3) Choose the extremal(s) of the functional :

1 point

$$J(y) = \int_0^1 \frac{y'^2}{x^3} dx$$

$$y = \frac{cx^3}{2} + b$$

$$y = \frac{cx^4}{8} + b$$

$$y = \frac{3cx^2}{2} + b$$

$$y = \frac{cx^4}{8} + bx$$

$$y = \frac{cx^2}{2} + bx$$

$$y = \frac{3cx^4}{2} + bx$$

No, the answer is incorrect.

Score: 0

Accepted Answers:

$$y = \frac{cx^4}{8} + b$$