Unit 10 - Week 8: Hyperelasticity - 1

Assignment 8

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

Due on 2020-11-11, 23:59 IST.

1) Principle of _____ states that the past events determine the future.

Hint

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) determinism

1 point

2) Principle of _____ states that the material response at a point depends only on the conditions within an arbitrarily small region about that point.

Hint

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) local action
(Type: String) local-action

1 point

3) A material without memory is called a _____ material.

Hint

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) elastic
(Type: String) elastic simple
(Type: String) simple elastic

1 point

4) A material whose constitutive relation depends on the deformation only through the history of local value of the deformation gradient tensor is called an _____ material.

Hint

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) simple

1 point

For Questions 5 - 13 use the following: For a St. Venant-Kirchhoff material the strain energy potential is given by
$\Psi(J, \boldsymbol{E}) = \frac{\kappa}{2}(\ln J)^2 + \mu \mathrm{tr}(\boldsymbol{E}^2)$. Here, κ and μ are material constants. The expression for the second Piola-Kirchhoff stress tensor is given by
$\boldsymbol{S} = a_1 \boldsymbol{C}^{a_2} + a_3(\boldsymbol{C} - \boldsymbol{I})$
where a_1, a_2, and a_3 are constants. The expression for the Kirchhoff stress tensor is given by
$\boldsymbol{\tau} = a_4 \boldsymbol{I} + a_5 \boldsymbol{b}(\boldsymbol{b} - \boldsymbol{I})$
where a_4, and a_5 are constants. The expression for the material elasticity tensor is given by
$\boldsymbol{\mathcal{C}} = a_6 \boldsymbol{C}^{a_7} \otimes \boldsymbol{C}^{a_7} - a_8 \boldsymbol{\mathcal{I}} + a_9 \frac{\partial \boldsymbol{C}}{\partial \boldsymbol{C}}$
where the material fourth order tensor $\boldsymbol{\mathcal{I}} = \frac{\partial \boldsymbol{C}^{-1}}{\partial \boldsymbol{C}}$. Assume $\kappa = 1$, $\mu = 2$, and $J = 2$.

5) The value of a_1 is _____. (up to two decimal places only).

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) .65,.72

1 point

6) The value of a_2 is _____.

Hint

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) -1

1 point

7) The value of a_3 is _____.

Hint

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 2

1 point

8) The value of a_4 is _____. (up to two decimal places only).

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) .65,.75

1 point

9) The value of a_5 is _____.

Hint

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 2

1 point

10) The value of a_6 is _____.

Hint

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 1

1 point

11) The value of a_7 is _____.

Hint

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) -1

1 point

12) The value of a_8 is _____. (up to two decimal places only).

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 1.35,1.45

0 points

13) The value of a_9 is _____.

Hint

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 4

1 point