

Unit 9 - Week 7: Kinetics - 2

Course outline

How does an NPTEL online course work?

Week 0 : Prerequisite

Week 1: Introduction

Week 2: Mathematical Preliminaries - 1

Week 3: Mathematical Preliminaries - 2

Week 4: Kinematics - 1

Week 5: Kinematics - 2

Week 6: Kinetics - 1

Week 7: Kinetics - 2

Lec 22: Work Conjugacy, First Piola-Kirchhoff Stress Tensor

Lec 23: Second Piola-Kirchhoff Stress Tensor, Decomposition of Stress - 1

Lec 24: Decomposition of Stress - 2, Objective Stress Measures

Lec 25: Solved Examples

Quiz : Assignment 7

Feedback form

Lecture Notes

Week 8: Hyperelasticity - 1

Week 9: Hyperelasticity - 2

Week 10: Linearization

Week 11: Discretization

Week 12: Solution Procedure

Live session

Assignment 7

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

Due on 2020-11-04, 23:59 IST.

1) Choose True/False for the following assertion: "Kirchhoff stress tensor is work conjugate with the rate of deformation tensor with respect to the current volume." **1 point**

- (a) True
 (b) False

No, the answer is incorrect.

Score: 0

Accepted Answers:

(b) False

2) Choose True/False for the following assertion: "The push-forward of the second Piola-Kirchhoff stress tensor to the current configuration gives the Kirchhoff stress tensor." **1 point**

- (a) True
 (b) False

No, the answer is incorrect.

Score: 0

Accepted Answers:

(a) True

3) Choose True/False for the following assertion: "Work per unit current volume is equal to the work per unit initial volume." **1 point**

- (a) True
 (b) False

No, the answer is incorrect.

Score: 0

Accepted Answers:

(b) False

4) Choose True/False for the following assertion: "Work per unit mass is invariant." **1 point**

- (a) True
 (b) False

No, the answer is incorrect.

Score: 0

Accepted Answers:

(a) True

5) Choose True/False for the following assertion: "The stress tensor work conjugate with the material rate of the stretch tensor \mathbf{U} is the symmetric part of the tensor $\mathbf{S}\mathbf{U}$." (Hint: Start with the fact that the second Piola-Kirchhoff stress tensor \mathbf{S} is work conjugate with the material rate of Green-Lagrange strain tensor \mathbf{E} and then substitute for \mathbf{E} in terms of \mathbf{U} to check.) **1 point**

- (a) True
 (b) False

No, the answer is incorrect.

Score: 0

Accepted Answers:

(a) True

6) Choose True/False for the following assertion: "Expression for the hydrostatic pressure p is given as $p = J^{-1}\mathbf{P} : \mathbf{P}$." (Hint: Decompose \mathbf{P} into deviatoric and hydrostatic part and then proceed) **1 point**

- (a) True
 (b) False

No, the answer is incorrect.

Score: 0

Accepted Answers:

(b) False

7) The deviatoric part of the second Piola-Kirchhoff stress tensor is *orthogonal* to the _____ tensor.

No, the answer is incorrect.

Score: 0

Accepted Answers:

(Type: String) right cauchy-green

(Type: String) right cauchy green

(Type: String) right cauchy green tensor

(Type: String) right Cauchy-Green

(Type: String) right Cauchy Green

(Type: String) Right Cauchy Green Deformation

1 point

8) The deviatoric part of the first Piola-Kirchhoff stress tensor is *orthogonal* to the _____ tensor.

No, the answer is incorrect.

Score: 0

Accepted Answers:

(Type: String) deformation gradient

(Type: String) deformation-gradient tensor

(Type: String) deformation gradient tensor

1 point