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Courses » Introduction To Composites

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Unit 10 - WEEK-09

Register for Certification exam

Course outline

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WEEK-09

- Lecture 49: Variation of elastic constants with respect to fiber orientation for generally orthotropic lamina

- Lecture 50 : Generally orthotropic lamina

Assignment 09

The due date for submitting this assignment has passed.

As per our records you have not submitted this assignment. **Due on 2019-04-03, 23:59 IST.**

1) How many independent elastic constants are necessary to define an isotropic material? **1 point**

- 21
- 9
- 5
- 2

No, the answer is incorrect.

Score: 0

Accepted Answers:

2

2) Select the correct option for a balanced lamina. **1 point**

- $E_L = E_T$ or $\nu_{LT} = \nu_{TL}$
- $E_L = E_T$ and $\nu_{LT} = \nu_{TL}$
- $E_L \neq E_T$ and $\nu_{LT} = \nu_{TL}$
- $E_L = E_T$ and $\nu_{LT} \neq \nu_{TL}$

No, the answer is incorrect.

Score: 0

Accepted Answers:

$E_L = E_T$ and $\nu_{LT} = \nu_{TL}$

13) Calculate E_x at 60° for a balanced lamina with following properties: **1 point**

$E_L = 15\text{GPa}$, $E_T = 15\text{GPa}$, $G_{LT} = 2.5\text{GPa}$, $\nu_{LT} = \nu_{TL} = 0.20$

- 7.89
- 8.01

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anisotropic materials

- Lecture 53: Elastic constants for Specially orthotropic materials
- Lecture 54: Elastic constants for Specially orthotropic materials in plane stress
- Lecture Note
- Quiz : Assignment 09
- Introduction To Composites : Feedback For Week 9
- Assignment 9 Solution

WEEK-10

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WEEK 12

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14) Calculate G_{xy} at 45° for a balanced lamina with following properties: **1 point**

$E_L=15\text{GPa}$, $E_T=15\text{GPa}$, $G_{LT}=2.5\text{GPa}$, $\nu_{LT}=\nu_{TL}=0.20$

6.25
 5.98
 4.55
 3.32

No, the answer is incorrect.
Score: 0

Accepted Answers:
6.25

15) Calculate ν_{xy} at 30° for a balanced lamina with following properties: **1 point**

$E_L=15\text{GPa}$, $E_T=15\text{GPa}$, $G_{LT}=2.5\text{GPa}$, $\nu_{LT}=\nu_{TL}=0.20$

0.573
 0.579
 0.417
 0.523

No, the answer is incorrect.
Score: 0

Accepted Answers:
0.523

16) Calculate m_x at 70° for a balanced lamina with following properties: **1 point**

$E_L=15\text{GPa}$, $E_T=15\text{GPa}$, $G_{LT}=2.5\text{GPa}$, $\nu_{LT}=\nu_{TL}=0.20$

0.579
 0.886
 0.900
 0.779

No, the answer is incorrect.
Score: 0

Accepted Answers:
0.886

7)What is the direction of loading relative to the direction of fiber in a **1 point** unidirectional lamina if E_x equals transverse modulus (E_T)?

90°
 60°
 30°
 0°

No, the answer is incorrect.
Score: 0

Accepted Answers:
 90°

8) What is the direction of loading relative to the direction of fiber in a unidirectional lamina for **1 point** maximum shear modulus?

- 0°
- 30°
- 45°
- 60°

No, the answer is incorrect.

Score: 0

Accepted Answers:

45°

9) Select the correct option, when $(E_x)_{\max}$ is greater than E_L and E_T .

1 point

- $G_{LT} > E_L/2(1+\nu_{LT})$
- $G_{LT} > E_L/(1+\nu_{LT})$
- $G_{LT} < E_L/2(1+\nu_{LT})$
- $G_{LT} < E_L/(1+\nu_{LT})$

No, the answer is incorrect.

Score: 0

Accepted Answers:

$G_{LT} > E_L/2(1+\nu_{LT})$

1.10) Determine the elements of stiffness matrix in GPa for a specially orthotropic unidirectional graphite-epoxy lamina under plane stress with the following engineering constants.

$E_L = 148.0$ GPa, $E_T = 10.5$ GPa, $G_{LT} = 5.61$ GPa, $\nu_{LT} = 0.3$

- $Q_{11}=3.17, Q_{12}=148.95, Q_{22}=10.56, Q_{66}=3.17$
- $Q_{11}=148.95, Q_{12}=3.17, Q_{22}=10.57, Q_{66}=5.61$
- $Q_{11}=138.27, Q_{12}=8.95, Q_{22}=15.56, Q_{66}=5.17$
- $Q_{11}=152.17, Q_{12}=6.95, Q_{22}=10.56, Q_{66}=7.17$

No, the answer is incorrect.

Score: 0

Accepted Answers:

$Q_{11}=148.95, Q_{12}=3.17, Q_{22}=10.57, Q_{66}=5.61$

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