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Unit 13 - WEEK 12

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Course outline

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WEEK 12

Lecture 67: Calculation of A, B and D Matrices.

Lecture 68: Simplification of Stiffness

Assignment 12

The due date for submitting this assignment has passed.

As per our records you have not submitted this assignment. **Due on 2019-04-24, 23:59 IST.**

1) A laminate is called quasi-isotropic when its is similar to that of an isotropic material. **1 point**

- bending stiffness matrix
- extensional stiffness matrix
- coupling stiffness matrix
- extensional and coupling stiffness matrix

No, the answer is incorrect.

Score: 0

Accepted Answers:

extensional stiffness matrix

2) Which of the following conditions exist for an orthotropic laminate with respect to in plane stresses and strains? **1 point**

- $D_{16} = D_{26} = 0$
- $A_{16} = A_{26} = D_{16} = D_{26} = 0$
- $A_{16} = A_{26} = 0$
- $A_{16} = A_{26} = 0$ and $[B] = 0$

No, the answer is incorrect.

Score: 0

Accepted Answers:

$A_{16} = A_{26} = 0$

3) Which of the following statements are true? **1 point**

- a) It is possible to design a laminate that will be symmetric as well as specially orthotropic with respect to in-plane stresses and strains.
- b) D_{16} and D_{26} cannot be made equal to zero for a symmetric laminate.

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Lecture 70:
Quasi-Isotropic
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Part-I.

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Assignment 12
Solution

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No, the answer is incorrect.

Score: 0

Accepted Answers:

Only a

4) The coupling between the extension and bending of the laminate introduced by the matrix [B] is attributable to the..... **1 point**

- anisotropy of the layers.
- orthotropy of the layers.
- heterogeneity of the laminate.
- all of these.

No, the answer is incorrect.

Score: 0

Accepted Answers:

heterogeneity of the laminate.

5) Which of the following laminates behave as a specially orthotropic material? **1 point**

- Angle-ply laminates.
- Cross-ply laminates.
- Anti-symmetric laminates.
- All of these.

No, the answer is incorrect.

Score: 0

Accepted Answers:

All of these.

6) (Note: Problem 6 to 8 have same data as given below) **1 point**

A balanced cross-ply laminate possessing mid-plane symmetry is made up of laminae having the following properties:



The laminate is subjected to a normal axial stress of 15 MPa and a shear stress of 1.0 MPa.

(Assumption: Laminate has a unit thickness and unit cross section.)

Find mid-plane strains for the laminate.

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No, the answer is incorrect.

Score: 0

Accepted Answers:

7) Calculate normal and shear stresses in 90° plies. **1 point**

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No, the answer is incorrect.

Score: 0

Accepted Answers:

8) While solving Problem 7, we assumed that strains produced in entire laminate is same as the mid plane strains. This assumption is valid as the..... **1 point**

- given laminate is balanced.
- given laminate is cross ply.
- given laminate is balanced cross-ply.
- given laminate is balanced and is it subjected to in-plane stresses only.

No, the answer is incorrect.

Score: 0

Accepted Answers:

given laminate is balanced and is it subjected to in-plane stresses only.

9) A laminate has ply orientation [45/0/45] where each ply is 4 mm thick. Its individual layers has the following stiffness matrix. **1 point**



If $N_x = N_y = 4000$ N/mm, $N_{xy} = 0$, $M_x = 25,000$ N.mm/mm and $M_y = M_{xy} = 0$, calculate mid-plane strains produced in laminate.

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No, the answer is incorrect.

Score: 0

Accepted Answers:

10) Calculate plate curvatures produced in the laminate as described in Problem 9. **1 point**

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No, the answer is incorrect.

Score: 0

Accepted Answers:

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