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NPTEL

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Courses » Introduction To Composites

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## Unit 6 - WEEK 05

Register for  
Certification exam

### Course outline

How to access  
the portal

WEEK 01

WEEK 02

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WEEK 05

- Lecture 25: Terminologies and basic concepts
- Lecture 26: Orthotropic material
- Lecture 27: Modeling of unidirectional composites
- Lecture 28: Composite density as a function of mass fraction and volume fraction
- Lecture 29: Calculation of longitudinal

## Assignment 05

The due date for submitting this assignment has passed.

As per our records you have not submitted this assignment.

**Due on 2019-03-06, 23:59 IST.**

1) An example of an isotropic material is:

**1 point**

- Composite laminate.
- Steel.
- A wooden bar.
- Feldspar.

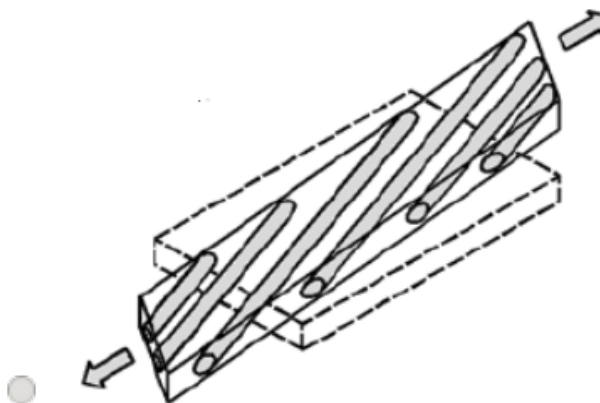
**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*Steel.*

2) Select the appropriate figure for an orthotropic composite material under uniaxial loading. In **1 point** these figures, dotted and solid lines indicate un-deformed and deformed material shapes, respectively.



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- Quiz : Assignment 05
- Introduction To Composites - II - Week 5 Feedback
- Assignment 5 Solution

WEEK 06

WEEK 07

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WEEK-09

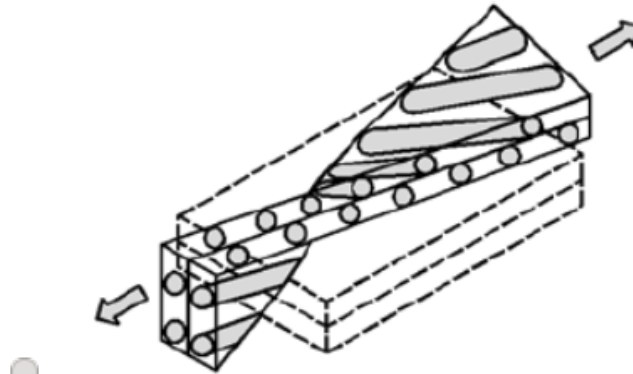
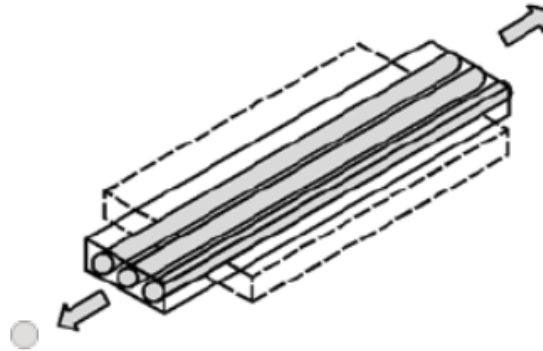
WEEK-10

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WEEK 12

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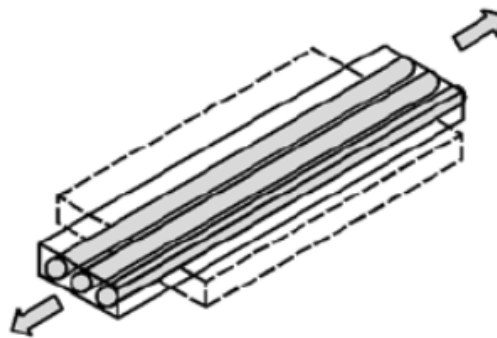


- None of these

No, the answer is incorrect.

Score: 0

Accepted Answers:



3) Macro-mechanical analysis of a lamina is based on average properties and by considering **1 point** the lamina to be:

- Isotropic.
- Non-homogeneous.
- Homogeneous.
- Non-linear

No, the answer is incorrect.

Score: 0

Accepted Answers:

Homogeneous.

4) In general, a unidirectional laminate is an example of:

**1 point**

- Isotropic Material.
- Anisotropic Material.
- Monoclinic Material.
- Orthotropic Material.

No, the answer is incorrect.

Score: 0

Accepted Answers:

*Orthotropic Material.*

5) The strength of a unidirectional lamina is usually much larger in the direction:

1 point

- of the fibers.
- perpendicular to the fibers.
- at a 45-degree angle to the fibers.
- none of the above.

No, the answer is incorrect.

Score: 0

Accepted Answers:

*of the fibers.*

6) For anisotropic materials, the application of an extensional load generates:

1 point

- only extensional strain.
- only shear strain.
- both shear and extensional strains.
- None of these

No, the answer is incorrect.

Score: 0

Accepted Answers:

*both shear and extensional strains.*

7) Which of the following definitions describe an orthotropic material?

1 point

- A material with one plane of material symmetry.
- A material with three mutually perpendicular planes of material symmetry.
- A material with an infinite number of planes of material symmetry.
- A material with no plane symmetry.

No, the answer is incorrect.

Score: 0

Accepted Answers:

*A material with three mutually perpendicular planes of material symmetry.*

8) The maximum fiber volume fraction for the packing geometry of circular fibers is possible in: 1 point

- Square array packing.
- Hexagonal array packing.
- Both hexagonal and square array packing.
- None of these

No, the answer is incorrect.

Score: 0

Accepted Answers:

*Hexagonal array packing.*

9) The maximum fiber volume fraction for the packing geometry of circular fibers in a hexagonal array is nearly \_\_\_\_\_ %. **1 point**

- 70  
 78.5  
 91  
 85

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

91

10) The material of a tension link is changed from aluminum to a unidirectional graphite-epoxy composite. Calculate the volume fraction of graphite fibers required in the composite to match its longitudinal modulus with that for aluminum. Use the following properties. **1 point**

$$E_{\text{aluminum}} = 70\text{GPa}, E_f = 250\text{GPa}, E_m = 3.5\text{GPa};$$

- 17%  
 57%  
 27%  
 37%

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

27%

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