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Courses » Theory of Rectangular Plates - Part 1

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Unit 2 - Assignment 0: Basics

Course outline

How to access the portal

Assignment 0: Basics

Quiz : Assignment 00

Week 1 : Basic Terminology, Equations and Methods

Week 2 : Derivation of Classical Plate Equations

Week 3 : Analytical Solution - Navier and Levy for Bending Case

Week 4 : Approximate Solution Techniques and 3D solution

Assignment 00

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

Due on 2018-07-23, 23:59 IST.

1) Euler-Bernoulli beam theory predicts accurate result if beam length (L) to thickness (h) ratio is *1 point*

- L/h=5
- L/h=10
- L/h<15
- L/h>20

No, the answer is incorrect.
Score: 0

Accepted Answers:
L/h>20

2) Number of independent constants in an orthotropic material are: *1 point*

- 13
- 2
- 5
- 9

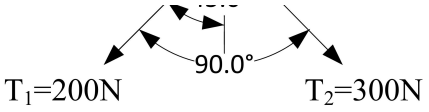
No, the answer is incorrect.
Score: 0

Accepted Answers:
9

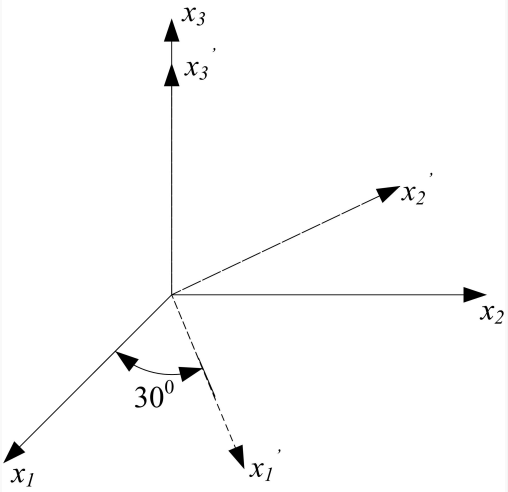
3) The tension in wire OB will be: *1 point*

- 541.66 N

Accepted Answers:
541.66 N



4) Transform a vector $a_i = [5 \quad 6 \quad 3]^T$ defined in (x_1, x_2, x_3) coordinate system into a new coordinate system $\left(x_1', x_2', x_3'\right)$ which is rotated by 30^0 in counterclockwise direction about x_3-axis as shown in figure. *1 point*



- $\left[3+\frac{5\sqrt{3}}{2} \quad \frac{-5}{2}+3\sqrt{3} \quad -3\right]^T$
- $\left[3-\frac{5\sqrt{3}}{2} \quad \frac{-5}{2}-3\sqrt{3} \quad 3\right]^T$
- $\left[1+\frac{5\sqrt{3}}{2} \quad \frac{-5}{2}+3\sqrt{3} \quad 3\right]^T$
- $\left[3+\frac{5\sqrt{3}}{2} \quad \frac{-5}{2}+3\sqrt{3} \quad 3\right]^T$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\left[3+\frac{5\sqrt{3}}{2} \quad \frac{-5}{2}+3\sqrt{3} \quad 3\right]^T$

5) Solve the following initial value problem: *1 point*

$y' - y = e^{2x}, \quad y(0) = 2$

- $3e^{2x} + e^x$
- $e^{2x} + e^x$
- $e^{2x} + e^{-x}$
- $e^{2x} + 3e^x$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$e^{2x} + e^x$

6) For Graphite-Epoxy composite, Young's modulus along longitudinal and transverse direction are $E_1 = 25\,GPa$ and $E_2 = 1\,GPa$, respectively. If $\nu_{12} = 0.28$, then ν_{21} will be: *1 point*

- 1.12
- 0.0112
- 0.28
- 0.028

No, the answer is incorrect.
Score: 0

Accepted Answers:
0.0112

7) For a given stress field $\sigma = \begin{bmatrix} 10 & -5 \\ -5 & 2 \end{bmatrix}$. The principal stresses will be: **1 point**

- 12.40, -0.403, 0
- 11.40, 0.403, 0
- -12.40, -0.403, 0
- 12.40, 0.403, 0

No, the answer is incorrect.
Score: 0

Accepted Answers:
12.40, -0.403, 0

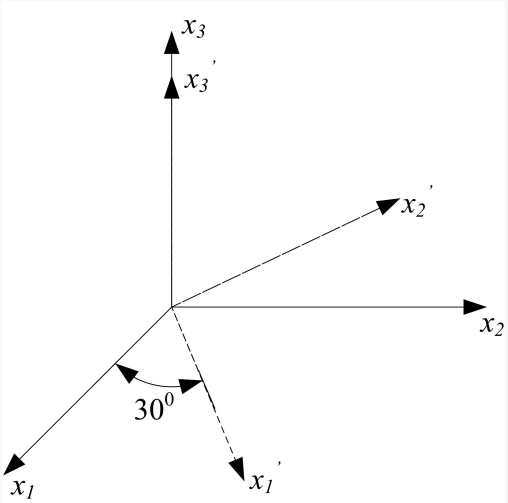
8) For a thick $0.01m$ steel flat panel of span a, governing equation is expressed as $Dw_{0,xxxx} = q_0$ where q_0 is uniformly distributed load. If panel is subjected to the following boundary conditions: at $x = 0$ & a, $w = 0$ & $M_{xx} = 0$ **1 point**
The deflection at $x = 0.5$ will be:

- $\frac{5a^3q_0}{384D}$
- $\frac{5a^4q_0}{24D}$
- $\frac{5a^4q_0}{384D}$
- $\frac{5a^3q_0}{24D}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\frac{5a^4q_0}{384D}$

9) Transform a matrix $a_{ij} = \begin{bmatrix} 1 & 0 & 2 \\ 2 & 2 & 0 \\ 3 & 0 & 5 \end{bmatrix}$ defined in (x_1, x_2, x_3) coordinate system into a new coordinate system $\left(x_1', x_2', x_3'\right)$ which is rotated by 30^0 in counterclockwise direction about x_3-axis as shown in the figure. **1 point**



- $\begin{bmatrix} 4.3260 & -1.3570 & 0.8421 \\ 0.1340 & 2.960 & -1.1200 \\ 2.9591 & -2.1534 & 2.5650 \end{bmatrix}$
- $\begin{bmatrix} \frac{-3}{4} & 0 & 0 \\ \frac{-1}{2} & \frac{3}{2} & 0 \\ 0 & 0 & 5 \end{bmatrix}$
- $\begin{bmatrix} 2.1160 & -0.0670 & 1.7321 \\ 1.9330 & 0.8840 & -1.0000 \\ 2.5981 & -1.5000 & 5.0000 \end{bmatrix}$

$$\begin{bmatrix} \frac{3}{4} & 0 & 0 \\ \frac{1}{2} & \frac{3}{2} & 0 \\ 0 & 0 & 5 \end{bmatrix}$$

No, the answer is incorrect.
Score: 0

Accepted Answers:

$$\begin{bmatrix} 2.1160 & -0.0670 & 1.7321 \\ 1.9330 & 0.8840 & -1.0000 \\ 2.5981 & -1.5000 & 5.0000 \end{bmatrix}$$

10) The roots of the following equation will be: ***1 point***

$w_{n,xxxx} - 2\pi^2 w_{n,xx} + \pi^4 w_n = 0$

- $3, -3, 3\sqrt{5}, -3\sqrt{5}$
- $5, -5, 5\sqrt{3}, -5\sqrt{3}$
- $5\pi, -5\pi, 5\sqrt{3}\pi, -5\sqrt{3}\pi$
- $\pi, -\pi, \pi, -\pi$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\pi, -\pi, \pi, -\pi$

End