Assignment 6

The due date for submitting this assignment has passed. Due on 2018-09-12, 23:59 IST.

As per our records you have not submitted this assignment.

1) What is the number of non zero strain components for a plane stress problem? 1 point

- (a) 6
- (b) 4
- (c) 3
- (d) 2

No, the answer is incorrect.
Score: 0

Accepted Answers:
(b) 4

2) What is the number of non zero stress components for a plane stress problem? 1 point

- (a) 4
- (b) 6
- (c) 2
- (d) 3

No, the answer is incorrect.
Score: 0

Accepted Answers:
(d) 3

3) What is the number of non zero strain components for a plane strain problem? 1 point

- (a) 3
- (b) 4
- (c) 2
- (d) 6

No, the answer is incorrect.
Score: 0

Accepted Answers:
(a) 3
5) Choose the correct option regarding a 2D continuum system from the following
1. Airy's stress function automatically satisfies the equilibrium equations.
2. In absence of body forces, Airy's stress function converts Beltrami-Michell equation to a bi-harmonic equation.

- (a) Both the statements are true
- (b) Only the statement 1 is true
- (c) None of the statements are true
- (d) Only the statement 2 is true

No, the answer is incorrect.
Score: 0
Accepted Answers:
(a) Both the statements are true

6) Let us consider a plane stress problem without any body forces. The Airy's stress function \( \phi \) is defined as; \( \phi = 6x^2y^3 \). Determine \( \sigma_{xx}, \sigma_{yy}, \text{and } \sigma_{xy} \)

- (a) \( \sigma_{xx} = 36x^2y, \sigma_{yy} = 12y^3, \text{and } \sigma_{xy} = -36xy^2 \)
- (b) \( \sigma_{xx} = 12y^3, \sigma_{yy} = 36x^2y, \text{and } \sigma_{xy} = -36xy^2 \)
- (c) \( \sigma_{xx} = -36x^2y, \sigma_{yy} = -12y^3, \text{and } \sigma_{xy} = 36xy^2 \)
- (d) \( \sigma_{xx} = 36xy, \sigma_{yy} = 12y^2, \text{and } \sigma_{xy} = 36xy^2 \)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(a) Both the statements are true

7) In a plane stress problem \( \sigma_{xx} = 5MPa, \sigma_{yy} = -10MPa, \sigma_{xy} = 7.5MPa \). Calculate \( \epsilon_{xx} \) if the Young’s modulus is 2 GPa and Poison ratio is 0.15.

- (a) \(-3.75 \times 10^{-4}\)
- (b) 0
- (c) \(7.5 \times 10^{-4}\)
- (d) \(3.75 \times 10^{-4}\)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(d) \(3.75 \times 10^{-4}\)
In a plane strain problem $\varepsilon_{xx} = 0.005$, $\varepsilon_{yy} = -0.001$, $\varepsilon_{yx} = 0.006$. Calculate $\sigma_{xx}$ if the Young’s modulus is 2 GPa and Poisson ratio is 0.25.

(a) 7.2 MPa
(b) 0 MPa
(c) 4.8 MPa
(d) 2.4 MPa

No, the answer is incorrect.
Score: 0
Accepted Answers:
(b) 0 MPa

9) Choose the correct statement regarding generalised plane stress problem

1. The out of plane displacement is zero
2. The average out of plane displacement is zero

(a) Only statement 1 is correct
(b) Only statement 2 is correct
(c) Both of them are correct
(d) None of them are correct

No, the answer is incorrect.
Score: 0
Accepted Answers:
(b) Only statement 2 is correct

10) Let us consider a thin cylinder with wall thickness $t$ and average radius $r_0$. The cylinder is acted upon by a uniform pressure of $P$. What is the hoop stress ($\sigma_0$) generated?

(a) $\frac{Pt}{t}$
(b) $\frac{Pr}{2t}$
(c) $\frac{Pr}{3t}$
(d) $\frac{Pr}{4t}$

No, the answer is incorrect.
Score: 0
Accepted Answers:
(a) $\frac{Pr}{t}$