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Courses » **Mechanics Of Materials** Announcements **Course** Ask a Question Progress Mentor

Unit 14 - Week 12 -Buckling of columns

Course outline

Week 0

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Week 4-Concept of strain

Week 5- Constitutive relation, strain energy and potential

Week 6- Displacement due to uniaxial loading, temperature and bending

Week 7 -Stresses and deflection in homogeneous beams loaded about one principal axis

Week 8 - Stresses and deflection in beams loaded about one principal axis

week 9: Stresses and deflection in beams not loaded about principal axis

Week 10: Stresses and displacement

Assignment 12

The due date for submitting this assignment has passed. **Due on 2018-04-18, 23:59 IST.**

Submitted assignment

1) A simply supported column of length 10 m made of brass with Young's modulus, $E = 200$ GPa is to support a compressive load of 10 kN. If the column is in the shape of an annular cylinder with outer diameter of 60 mm, find the inner diameter of the cylinder to safely support the load = _____ mm.

No, the answer is incorrect.

Score: 0

Accepted Answers:

(Type: Range) 40.2,40.4

20 points

2) A column is oriented such that its axis coincides with x axis and it has a cross section of an annular ellipse such that the moment of inertia about the z axis, I_{zz} is greater than the moment of inertia about the y axis, I_{yy} . If this column is subjected to a compressive axial load acting through the centroid of the cross section, the maximum transverse displacement would occur along which direction? y or z

- y
 z

No, the answer is incorrect.

Score: 0

Accepted Answers:

z

10 points

3) Choose the best option among the following. A beam – column is subjected to both compressive axial force and a transverse load. The actual maximum axial stress in the beam column would be -

- Sum of the axial stress due to compressive axial force and bending stress due to transverse load
 More than the sum of the axial stress due to compressive axial force and bending stress due to transverse load
 Less than the sum of the axial stress due to compressive axial force and bending stress due to transverse load

No, the answer is incorrect.

Score: 0

Accepted Answers:

More than the sum of the axial stress due to compressive axial force and bending stress due to transverse load

due to torsion or inflation**Week 11****Week 12 - Buckling of columns**

- General Concepts
- Euler critical load for simply supported column
- Euler critical load for column with any boundary condition
- Secant formula
- Pressure vessel and failure theory
- Determination of maximum load carrying capacity of a simple truss
- Quiz : Assignment 12
- Week 12 Feedback : Mechanics Of Materials
- Solution for assignment - 12

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The line of action of a 400 kN load is parallel to the geometric axis of a simply supported beam-column with circular cross section of diameter 200 mm and having a Young's modulus, $E = 200$ GPa. The length of the beam-column is 8 m. The load is acting at a radial distance of 10 mm from the centroid of the cross section. For this beam column find the following:

4) Euler critical load for the beam-column _____ MN

No, the answer is incorrect.

Score: 0

Accepted Answers:

(Type: Range) 2.41,2.43

15 points

5) Magnitude of the deflection at midpoint of the beam-column _____ mm

No, the answer is incorrect.

Score: 0

Accepted Answers:

(Type: Range) 2.44,2.46

15 points

6) Maximum bending moment in the column _____ kNm

No, the answer is incorrect.

Score: 0

Accepted Answers:

(Type: Range) 4.97,4.99

15 points

7) Maximum axial stress in the column _____ MPa

No, the answer is incorrect.

Score: 0

Accepted Answers:

(Type: Range) 19.06,19.08

15 points

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