Assignment 9

This is the deadline for submitting this assignment. 
As per our records you have not submitted this assignment.

Due on 2019-10-02, 03:09 IST.

1. Which of the following hold true for pure bending of a beam?
   - bending moment is a scalar along the length of the beam
   - shear force is absent in the beam's cross-section
   - a straight beam deflection is due to an arc of a circle
   - none of these
   - the answer is incorrect.
   
   Accepted Answers: None of these

2. Under what condition does the neutral axis not pass through the beam's cross-section's centroid?
   - when the cross-section is circular or rectangular
   - when the cross-section is non-symmetrical and has arbitrary axes
   - when the bending moment is not aligned along the cross-section's principal axis
   - none of these
   - the answer is incorrect.
   
   Accepted Answers: None of these

3. Think of a composite circular beam having inner core of aluminium and outer shell of steel. Which of the following hold true during pure bending of such a beam?
   - bending stress (σ) at a point in the cross-section is proportional to the point's distance from the neutral axis
   - bending strain (e) at a point is proportional to the point's distance from the cross-section's centre
   - bending stress (σ) becomes discontinuous at the interface of inner core and outer shell
   - none of these
   - the answer is incorrect.
   
   Accepted Answers: None of these

4. Which of the following hold true for pure bending of a rectangular beam?
   - neutral axis always coincides with the direction of applied bending moment
   - when the bending moment does not act along the principal axes of the cross-section, the neutral axis and bending moments' direction do not coincide
   - when the rectangular cross-section becomes square, the direction of bending moment and neutral axis always coincide
   - none of these
   - the answer is incorrect.
   
   Accepted Answers: None of these

5. During non-uniform bending of rectangular beams (with the bending moment aligned along the cross-section's principal axes), which of the following hold true?
   - no shear stress acts in the cross-section
   - shear stress varies in the cross-section with its maximum value at the neutral axis
   - the ratio of shear stress at the neutral axis to the value of average shear stress equals 1.3
   - shear stress varies along all four edges of the cross-section
   - the answer is incorrect.

   Accepted Answers: None of these

6. Which of the following hold true during pure bending?
   - when the bending moment does not act along the principal axes of the cross-section, the neutral axis and bending moments' direction do not coincide
   - when the rectangular cross-section becomes square, the direction of bending moment and neutral axis always coincide
   - shear stress varies along all four edges of the cross-section
   - none of these
   - the answer is incorrect.
   
   Accepted Answers: None of these

7. What is the cross-section that the following hold true: shear stress across the cross-section's perimeter is aligned along the panhandle. If the distributed load on the beam's outer surface has no axial component?
   - for a cross-section circles
   - only for thin cross-sections
   - only for open cross-sections
   - it is never true
   - the answer is incorrect.

   Accepted Answers: Only for open cross-sections

8. What simplification does the assumption of the cross-section lead to so that we are able to obtain analytical formulae for shear stress distribution in unsymmetrical beam?
   - the direction of shear stress gets fixed along the cross-section's perimeter everywhere through the thickness of the cross-section
   - the magnitude of shear stress becomes constant through the thickness of the cross-section
   - even without the cross-section being thin, we can obtain analytical formulae for shear stress
   - none of these
   - the answer is incorrect.

   Accepted Answers: Even without the cross-section being thin, we can obtain analytical formulae for shear stress

9. Why did we need cross-section to be an open? while deriving shear stress distribution in unsymmetrical beam?
   - it is not necessary
   - shear stress becomes constant through the thickness of the cross-section
   - it is only necessary
   - none of these
   - the answer is incorrect.

   Accepted Answers: Even without the cross-section being open, the shear stress (σ) at any cross-section becomes known

10. Think of an arbitrary cross-section such that I_y = 3 I_x. Further suppose that the bending moment acts along the axis, what would be the angle between neutral axis and the x-axis of the cross-section?
    - we also need to know 60 degrees
    - 90 degrees
    - 0 degrees
    - none of these
    - the answer is incorrect.

    Accepted Answers: 90 degrees