1. The cross-section of a bar is subjected to a uniaxial tensile stress p. The tangential stress on a plane inclined at θ to the cross-section of the bar would be
   a. P sin 2θ / 2
   b. P sin 2θ
   c. P cos 2θ / 2
   d. P cos 2θ

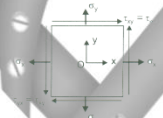
2. Consider the following statements :
   1. On planes having maximum and minimum principal stresses. There will be no tangential stress.
   2. Shear stresses on mutually perpendicular planes are numerically equal.
   3. Maximum shear stress is equal to half the sum of the maximum and minimum principal stresses.

   Of these statements
   a. 1 , 2 and 3 are correct
   b. 1 and 2 are correct
   c. 2 and 3 are correct
   d. 1 and 3 are correct

3. In a stressed body, an elements cube of material is taken at a point with is forces perpendicular to x and y reference axes. Tensile stresses equal to 15 kN/cm² and 9 kN/cm² are observed on these respective forces. They are also accompanied by shear stresses equal to 4 kN/cm² the magnitude of the principal stresses at the point are
   a. 12 kN/cm² tensile and 3 kN/cm² tensile
   b. 17 kN/cm² tensile and 7 kN/cm² tensile
   c. 9.5 kN/cm² tensile and 6.5 kN/cm² tensile
   d. 19 kN/cm² tensile and 13 kN/cm² tensile

4. In a rectangular element subjected to like principal tensile stresses p_1 and p_2 in two mutually perpendicular directions x and y, the maximum shear stress would occur along the
   a. Plane normal to x-axis
   b. Plane normal to x-axis
   c. Plane at 45° to y-direction
   d. Planes at 45° and 135 to y-direction

5. On an element shown in the given figure, the stresses are (in Mpa)



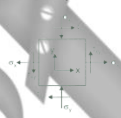
   The radius of mohr's circle and the principle stresses σ_1 σ_2 are (in Mpa)

	Radius = r	σ_2	σ_1
a.	50	120	20
b.	55	30	110
c.	60	140	20
d.	70	140	20

6. At a point in a strained material, if two mutually perpendicular tensile stresses of 2000 kg/cm² and 1000 kg/cm² are acting, then the intensity of tangential stress on a plane inclined at 15 to the axis of the minor stress will be
   a. 125 kg/cm²
   b. 250 kg/cm²
   c. 500 kg/cm²
   d. 1000 kg/cm²

7. In a plane stress problem there are normal tensile stresses σ_x and σ_y accompanied by shear stress τ_{xy} at a point along orthogonal cartesian co-ordinates x and y respectively. If it is observed that the minimum principal stress on a certain is zero then
   A. $\tau_{xy} = \sqrt{\sigma_x + \sigma_y}$
   B. $\tau_{xy} = \sqrt{\sigma_x - \sigma_y}$
   C. $\tau_{xy} = \sqrt{\sigma_x . \sigma_y}$
   D. $\tau_{xy} = \sqrt{\sigma_x / \sigma_y}$

8. The state of stresses on an element is shown in the given figure. The values of stresses are σ_x (= 32 Mpa); σ_y (= -10 Mpa) and major principal stress σ_1 (= 40MPa). The minor principal stress σ_2 is

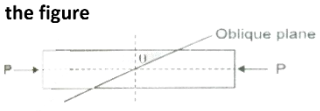


   a. -22 Mpa
   b. -18 Mpa
   c. -22 Mpa
   d. Indeterminable due to insufficient data

9. The radius of mohr's circle of stress of a strained element is 20 N/mm² and minor tensile stress in 10 n/mm² . The major principal stress is
   a. 30 N/mm²
   b. 50 N/mm²
   c. 60 N/mm²
   d. 100 N/mm²

10. If prismatic member having area of cross-section 'A' is subjected to a tensile load 'P' then the maximum shear stress and its inclination with the direction of load will be
    a. P/A and 45°
    b. 2P/A and 45°
    c. P/2A and 45°
    d. P/A and 60°

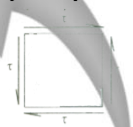
11. A bar of square cross-section, having an area of cross-section 'A' is subjected to a compressive force 'P' as shown in the figure



    A. $\frac{P}{A}\sin 2\theta$
    B. $\frac{P}{A}\cos 2\theta$
    C. $\frac{P}{2A}\sin 2\theta$
    D. $\frac{P}{2A}\cos 2\theta$

12. The radius of mohr's circle is zero when the state of stress is such that
    a. Shear stress is zero
    b. There is pure shear
    c. There is no shear stress but identical direct stresses
    d. There is no shear stress but equal identical direct stresses, opposite in nature , in two mutually perpendicular directions

13. The figure shown the stress condition of an element, the principal stresses are



    a. ± 2 τ
    b. ± τ /2
    c. ± τ
    d. ± 2 τ /3

14. If the principal stresses at a point in a stressed body are 150 kN /m² tensile and 50 kN/m² compressive, then maximum shear stress at this point will be
    a. 100 kN/m² f
    b. 150 kN/m² f
    c. 200 kN/m² f
    d. 250 kN/m² f

15. In the mohr's circle for strains , radius of mohr's circle gives the
    a. Minimum value of normal strain
    b. Maximum value of normal strain
    c. Maximum vale of shear strain
    d. Half of maximum value of shear strain