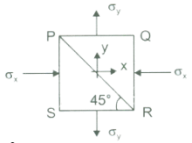
01. A thin wooden plate PQRS is made by gluing two pieces of wood along PR a shown in the above diagram



If σ_x = - 30 mpa , σ_y = 10 Mpa and τ_{xy} = 0 then what is the
Normal stress on the surface PR?
a. -10 Mpa
b. - 20 Mpa
c. 110 Mpa
d. 20 MPa

02. In a palne strain condition in the xy plane, the strain components associated with xy axes
Are $\varepsilon_x = 80 \times 10^{-6}$, $\varepsilon_y = 100 \times 10^{-6}$, $\phi_{xy} = -800 \times 10^{-6}$
What are the principal strain for these values ?
a. 981×10^{-6} , $- 81 \times 10^{-6}$
b. 981×10^{-6} , $- 81 \times 10^{-6}$
c. 881×10^{-6} , 71×10^{-6}
d. 839×10^{-6} , $- 81 \times 10^{-6}$

03. In a plane strain in the xy plane, normal strain in x and y directions are equal to zero and shear strain is equal to 3×10^{-6} . What is the value f diameter of mohr's circle strain for these strain values ?
a. 6×10^{-6}
b. 3×10^{-6}
c. 1.5×10^{-6}
d. Zero

04. For a case of plane stress, σ_x = 40MN / m^2 σ_y = 0 , τ_{xy} = 80 MN / m^2 . What are the principal stresses and their orientation with x and y axes ?
a. σ_1 = 80 MN / m^2
σ_2 = 40 MN / m^2 , $\theta_1 = 30^\circ$
b. σ_1 = 100 MN / m^2
σ_2 = -60 MN / m^2 , $\theta_1 = 32^\circ$
c. σ_1 = 102.5 MN / m^2
σ_2 = -62.5 MN / m^2 , $\theta_1 = 36^\circ$
d. σ_1 = 105 MN / m^2 , σ_2 = 62 MN / m^2 , $\theta_1 = 36^\circ$

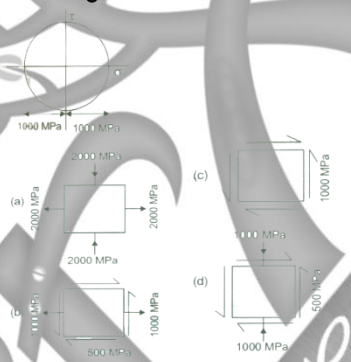
05. σ_x σ_y and τ are normal and shear stresses on the x and y faces, what is the radius of mohr's circle in terns of their stress ?
A. $\frac{\sigma_x - \sigma_y}{2}$
B. $\frac{\sigma_x - \sigma_y}{2} + \tau_{xy}$
C. $\sqrt{\left(\frac{\sigma_x - \sigma_y}{2}\right)^2 + \tau_{xy}^2}$
D. $\sqrt{\left(\frac{\sigma_x + \sigma_y}{2}\right)^2 - \tau_{xy}^2}$

06. In a plane strain problem in xy plane, the shear strain = 12×10^{-6}, and the normal strain in x and y direction = 0. for this state of strain, what is the diameter of the mohr's circle of strain
a. 6×10^{-6}
b. 8×10^{-6}
c. 12×10^{-6}
d. 24×10^{-6}

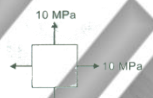
07. At a certain point in a strained material, there are two mutually perpendicular stresses σ_x = 100 N/ mm^2 (Tensile) and σ_y = 50 N/mm^2 (Compressive) .[Notation (+) ; compression (-)]. What are the values of the principal stresses in N/mm^2 at that point?
a. 100 – 50
b. -100 , 50
c. 75, - 25
d. -75, 25

08. For a state of plane stress $\sigma_2 = \sigma_y$ = 20 Mpa. What are the values of the maximum in–plane shearing stress and absolute maximum shearing stress?
a. (± 10 , 20) Mpa
b. (± 10 , 10) Mpa
c. (± 20 , 10) Mpa
d. (± 20 , 20) Mpa

09. The mohr's circle given above corresponds to which one of the following stress conditions :



10. What is the diameter of mohr's circle of stress for the state of stress shown above?



a. 20
b. 10 √2
c. 10
d. Zero

11. In a plane strain situation in xy plane, the displacement at a point are given as :
U = (-2x + 8y) x 10^{-6} unit
V = (-3x + 5y) x 10^{-6} unit
What is the shearing strains ?
a. 9×10^{-6}
b. 7×10^{-6}
c. 5×10^{-6}
d. 3×10^{-6}

12. In a bi-axial strain system ε_x and ε_y , what is the maximum engineering shearing strain ?
a. $\varepsilon_x + \varepsilon_y$
b. $\varepsilon_x - \varepsilon_y$
c. $\frac{\varepsilon_x + \varepsilon_y}{2}$
d. $\frac{\varepsilon_x - \varepsilon_y}{2}$

13. If a body carries two unlike principal stress what is the maximum shear stress?
a. Half the difference of magnitude of the principal stresses
b. Half the sum of the magnitude of principal stresses
c. Difference of the magnitude of principal stresses
d. Sum of the magnitude of principal stresses

14. What is the radius of mohr's circle in case of bi-axial state of stress?
a. Half the sum of the two principal stresses
b. Half the difference of the two principal stresses
c. Difference of the two principal stresses.
d. Sum of the two principal stresses.

15. A two-dimensional stress system has like stresses σ_x = 100 N/mm^2 and σ_y = 200 N/m^2 in two mutually perpendicular directions. The x, y co-ordinates of the centre of the mohr's circle are
a. (0, 150)
b. (150, 0)
c. (-50, 0)
d. (50, 0)