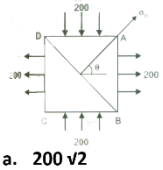
01. A square element is subjected to principal stresses in N/mm² as in figure. Te intensity of normal stress σ_n on plane BD is (θ = 45°)



a. 200 √2
b. 100
c. 200
d. 0

02. Consider the following statements If there is a state of pure shear τat a point then

1. The mohr's circle is tangential to the y-axis
2. The centre of the mohr's circle coincides with the origin
3. Unlike principal stresses are each numerically equal to τ.
4. Principal stresses are alike

Which of the above statements is /are correct

a. 1 only
b. 1 and 2
c. 2 and 3
d. 3 and 4

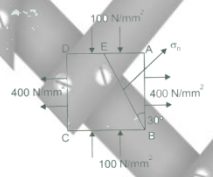
03. Which one of the following statements is correct ?

a. Principal stress is defined as the shear stresses on which the normal stress is maximum or minimum.
b. The centre of mohr's circle for a two=dimensional stress system always lies in the y-axis (adopting conventional axes notation)
c. The plane of maximum shear stress is inclined to the plane of principal stress at an angle of 45°
d. In case of biaxial state of normal stresses, the normal stress on 45°plane is equal to the sum of normal stresses.

04. In a two-dimensional stress system, the radius of the mohr's circle represents

a. Maximum normal stress
b. Minimum normal stress
c. Minimum shear stress
d. Maximum shear stress

05.



The principal stresses in N/ mm² on a rectangular element are shown in the above figure. The Intensity of normal stress σ_n on the oblique plane BE is

a. 125 N/mm²
b. 425 N/mm²
c. 375 N/mm²
d. 250 N/mm²

06. A rectangular bar of cross-sectional area A is subjected to an axial tensile load P. the maximum shear stress will occurs on a plane at X° to any normal cross-section where X° is

a. 90°
b. 270°
c. 180°
d. 45°

07. The state of two-dimensional stresses acting on a concrete lamina constant of a direct tensile stress σ_x τ = 1.5 n /mm² and shear stress τ = 1.20 N/mm² when cracking of concrete is just impending the permissible tensile strength of the concrete

a. 1.50 N/mm²
b. 2.17 N/mm²
c. 2.08 N/mm²
d. 2.29 N/mm²

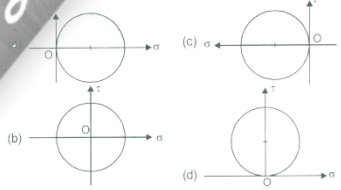
08. The principal stresses at a point in a bar are 160 N/mm² (tensile) and 80 N/mm² (compressive). The accompanying maximum shear stress intensity is

a. 100 N/mm²
b. 110 N/mm²
c. 120 N/mm²
d. 140 N/mm²

09. At a point the web of a girder bending and the shearing stresses are 90 N/mm² (tensile) and 5 N/mm² respectively . The principal stresses are

a. 108.64 N/mm² (tensile) and 18.64 N/mm² (compressive)
b. 107.60 N/mm² (compressive) and 18.64 N/mm² (tensile)
c. 108.64 N/mm² (compressive) and 18.64 N/mm² (tensile)
d. 0.64 N/mm² (tensile) and 0.78 N/mm² (compressive)

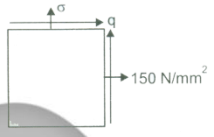
10. Which one of the following mohr's circles represents the state of pure shear ?



11. A mild steel bar is subjected to an axial force P, resulting in an axial stress σ_x = 100 N/mm² . What would be the normal Stress σ_n on a plane n-n making an angle θ= 45° with its axis ?

a. 25 N/mm²
b. 40 N/mm²
c. 50 N/mm²
d. 100 N/mm²

12. The state of stress on an element in plane stress is shown as in the figure.



What is the value of σ if the values of the principal stresses are 164 N/mm² and 36 N/mm² , both tensile?

a. 100 N/mm²
b. 75 N/mm²
c. 62.5 N/mm²
d. 50 N/mm²

13. The biaxial stress system in an element is shown in the figure. Which of the following will give the normal stress in N/mm² in the plane BD making an angle of 45 with the plane BA?

a. 25
b. 20
c. 15
d. 10