

1. Given the stress field:

$$[\sigma] = \begin{bmatrix} \sigma_{xx} & \sigma_{xy} & \sigma_{xz} \\ \sigma_{yx} & \sigma_{yy} & \sigma_{yz} \\ \sigma_{zx} & \sigma_{zy} & \sigma_{zz} \end{bmatrix} = \begin{bmatrix} x^2 & xy & xz \\ yx & y^2 & yz \\ zx & zy & z^2 \end{bmatrix}$$

Find

- (1). Body force field.
- (2). Find the principal stress and direction for $(1, 1, 1)$ point.
- (3). Find the traction on the plane with normal $(\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}, 0)$.
- (4). Find σ_{nn} .