**1**. Given the displacement field:

$$u_x = x^2 + xyz \tag{1}$$
$$u_y = y^2 \tag{2}$$
$$u_z = xy \tag{3}$$

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