**3.**

$$\begin{vmatrix} 0 & xy^2 & xz^2 \\ x^2y & 0 & yz^2 \\ x^2z & zy^2 & 0 \end{vmatrix}$$

**Solution:**

**Given,** $\begin{vmatrix} 0 & xy^2 & xz^2 \\ x^2y & 0 & yz^2 \\ x^2z & zy^2 & 0 \end{vmatrix}$

[Taking $x^2$, $y^2$ and $z^2$ common from $C_1$, $C_2$ and $C_3$, respectively]

$$= x^2y^2z^2 \begin{vmatrix} 0 & x & x \\ y & 0 & y \\ z & z & 0 \end{vmatrix}$$

[Applying $C_2 \rightarrow C_2 - C_3$]

$$= x^2y^2z^2 \begin{vmatrix} 0 & 0 & x \\ y & -y & y \\ z & z & 0 \end{vmatrix} = x^2y^2z^2 \, (x(yz + yz))$$

$$= x^2y^2z^2 \cdot (2xyz) = 2x^3y^3z^3$$