Switching to spherical coordinates we set up the integral as

$$\int_0^{2\pi}\int_0^{\pi}\int_0^{\sqrt{2}} \rho^2 \cdot \rho^2 \sin\phi d\rho d\phi d\theta$$
$$\int_0^{2\pi}\int_0^{\pi}\int_0^{\sqrt{2}} \rho^4 \sin\phi d\rho d\phi d\theta$$
$$= \int_0^{2\pi}\int_0^{\pi} \frac{(\sqrt{2})^5}{5} \sin\phi d\phi d\theta$$
$$= \frac{4\sqrt{2}}{5}\int_0^{2\pi} (-\cos\phi)|_0^{\pi} d\theta$$
$$= \frac{4\sqrt{2}}{5} \cdot 2 \cdot 2\pi = \frac{16\pi\sqrt{2}}{5}.$$