Sheet-7

Q.1 Find the surface area of the part of the cone $z = \sqrt{x^2 + y^2}$ that lies inside the cylinder $x^2 + y^2 = 2x$.

Answer: $\sqrt{2}\pi$.

Q.2 Find the surface area of the portion of the paraboloid $z = 4 - x^2 - y^2$ that lies inside the cylinder $x^2 + y^2 = 1$.

Answer: $\frac{\pi}{6}(5^{\frac{3}{2}} - 1)$.

Q.3 Find the surface area of the portion of the paraboloid $z = 6 - x^2 - y^2$ that lies inside the cone $z = \sqrt{x^2 + y^2}$.

Answer: $\frac{\pi}{6}(17^{\frac{3}{2}} - 1)$.

Q.4 Find the volume of the region Q under the plane $z = x + y$ and over the region of in the xy-plane bounded by the parabola $y = x^2$ and the line $y = 2x$.

Answer: $\frac{84}{15}$.

Q.5 Find the volume of the region Q bounded by the paraboloid $z = x^2 + y^2$ and the planes $z = 1$ and $z = 2$.

Answer: $\frac{3\pi}{2} - \frac{8}{15}$.

Q.6 Find the volume of the solid bounded by the cylinder $y = x^2$ and the planes $y + z = 4$ and $z = 0$.

Answer: $\frac{256}{15}$.

Q.7 Find the volume of the region Q bounded by the graphs of the equations $z = 3x^2$, $z = 4 - x^2$, $y = 0$ and $y + z = 6$.

Answer: $\frac{304}{15}$.