

Q.6) Evaluate $\int_0^1 \int_0^2 \int_1^2 xyz \, dx \, dy \, dz$

$$= \int_0^1 \int_0^2 (xyz)^2 \, dx \, dy$$

$$= \int_0^1 \int_0^2 (xy(2) - xy(1)) \, dx \, dy$$

$$= \int_0^1 \int_0^2 (xy) \, dx \, dy$$

$$= \int_0^1 \left(\frac{xy^2}{2} \right) \Big|_0^2 \, dy$$

$$= \int_0^1 \left(\frac{x(2)^2}{2} \right) \, dx$$

$$= \int_0^1 2x \, dx$$

$$\left(\frac{2x^2}{2} \right) \Big|_0^1 = 1 + 0$$