(c) $\int_0^3 \delta(t) \sin 5\pi t \, dt$

Sol^n: We know, $\delta(t) = \begin{cases} 1, & t=0 \\ 0, & \text{elsewhere} \end{cases}$

$$\therefore \int_0^3 \delta(t) \sin 5\pi t \, dt$$

$$= \left[\sin 5\pi t \right]_{t=0}$$

$$= 0$$

(d) $\int_{-\infty}^{\infty} (t-2)^3 \delta(t-2)\, dt$

Sol^n. We know,

$$\delta(t-2) = \begin{cases} 1, & t=2 \\ 0, & \text{elsewhere} \end{cases}$$

$$\therefore \int_{-\infty}^{\infty} (t-2)^3 \delta(t-2)\, dt$$

$$= \left[(t-2)^3 \right]_{t=2}$$

$$= 0$$