

$$\textcircled{11} \int x^4 \ln x \, dx$$

$$u = \ln x \quad dv = x^4$$

$$du = \frac{1}{x} dx \quad v = \frac{1}{5} x^5$$

$$= \frac{1}{5} x^5 \ln x - \int \frac{1}{5} x^5 \cdot \frac{1}{x} dx$$

$$= \frac{1}{5} x^5 \ln x - \frac{1}{5} \int x^4 dx$$

$$= \frac{1}{5} x^5 \ln x - \frac{1}{25} x^5 \Big|_1^e$$

$$\frac{1}{5} e^5 \ln e - \frac{1}{25} e^5 - \left( 0 - \frac{1}{25} \right)$$

$$\frac{5}{25} e^5 - \frac{1}{25} e^5 + \frac{1}{25}$$

$$\frac{4e^5 + 1}{25} \textcircled{B}$$

$$\textcircled{12} \quad v = \int 6t \, dt = 3t^2 + C$$
$$v(0) = 10 = 3(0)^2 + C \quad C = 10$$

$$v = 3t^2 + 10$$

$$s = \int v(t) \, dt = t^3 + 10t + C$$

$$s(0) = 7 = 0^3 + 10(0) + C \quad C = 7$$

$$s(2) = 8 + 20 + 7 = 35 \quad \textcircled{D}$$