A LCR circuit behaves like a damped harmonic oscillator. Comparing it with a physical spring-mass damped oscillator having damping constant 'b', the correct equivalence would be: (JEE MAIN 2020)

(A) $L \leftrightarrow k, C \leftrightarrow b, R \leftrightarrow m$

(B) $L \leftrightarrow m, C \leftrightarrow k, R \leftrightarrow b$

(C) $L \leftrightarrow m, C \leftrightarrow \frac{1}{k}, R \leftrightarrow b$

(D) $L \leftrightarrow \frac{1}{b}, C \leftrightarrow \frac{1}{m}, R \leftrightarrow \frac{1}{k}$

For spring-mass damped oscillator

$ma + bv + kx = 0$

$\Rightarrow m\frac{d^2x}{dt^2} + b\frac{dx}{dt} + kx = 0$ —— (1)

For LCR circuit

$L\frac{di}{dt} + iR + \frac{q}{C} = 0$

$\Rightarrow L\frac{d^2q}{dt^2} + R\frac{dq}{dt} + \frac{q}{C} = 0$ —— (2)

On comparing (1) & (2)

$L \Leftrightarrow m$, $b \Leftrightarrow R$, $C \Leftrightarrow \frac{1}{k}$