If the length of the pendulum in pendulum clock increases by 0.1%, then the error in time per day is:

(a) 86.4 s

(b) 4.32 s

(c) 43.2 s

(d) 8.64 s

(c) Time period, $T = 2\pi\sqrt{\dfrac{\ell}{g}}$

$\therefore \dfrac{\Delta T}{T} = \dfrac{1}{2}\dfrac{\Delta\ell}{\ell}$

Error in time period in one day

$\Rightarrow \Delta T = \dfrac{1}{2}\times\dfrac{0.1}{100}\times 24\times 3600 = \dfrac{1}{2}\times\dfrac{0.1}{100}\times 86400$

$\Rightarrow \Delta T = 43.2\,s$