7.4 To reduce the reasonant frequency in an LCR series circuit with a generator

(a) the generator frequency should be reduced.

(b) another capacitor should be added in parallel to the first.

(c) the iron core of the inductor should be removed.

(d) dielectric in the capacitor should be removed.

4. In a L-C-R circuit,

Resonant frequency $\Rightarrow$ $\boxed{w_0 = \dfrac{1}{\sqrt{LC}}}$ rad/s

As $w_0 \propto \dfrac{1}{\sqrt{L}}$ & $w_0 \propto \dfrac{1}{\sqrt{C}}$

$\Rightarrow$ To reduce w_0; <u>L or C has to be increased</u>

<u>Option (a)</u> As w_0 ~~doesn~~ only depends on L & C; so, it
(X)   cannot be decreased with generator frequency.

<u>Option (b)</u> Connecting two capacitors in parallel increases the
(✓)   effective capacitance $\Rightarrow$ ~~C_{eff}~~ C_{eff} increases.

<u>Option (c)</u>   Removing the iron core of the inductor decreases
(X) L_{eff}.

<u>Option (d)</u>   As ~~ϵ_0~~ $C_{eff} \propto K$ (dielectric constant) $\Rightarrow$
(X)   By removing the dielectric, C_{eff} decreases.

$\Rightarrow$ Option (b) is the answer.