7.

All filters are high Pass.

∴ Transfer function of Butterworth high Pass filter

$\Rightarrow H_{HP}(u,v) = \dfrac{1}{1 + \left(D_0 / D(u,v)\right)^{2n}}$

$\Rightarrow D_0 = $ cut off frequency

$\Rightarrow$ Spatial kernel $\rightarrow h_{HP} = \mathcal{F}^{-1}(H_{HP}(u,v))$

$\qquad\qquad\qquad\qquad\quad = \mathcal{F}^{-1}(1 - H_{LP}(u,v))$

$\qquad\qquad\qquad\qquad\quad = \delta(x,y) - h_{LP}(x,y)$

$\Rightarrow$ due to presence of delta function there is spike at center.