Ans ① $g_1 = f_1 + h_2 * f_2$

Take DFT of this equation to get

$\cancel{G_1(x,y) \quad F_1 \otimes G_1(x,y)}$

$$G_1(u,v) = F_1(u,v) + H_2(u,v) . F_2(u,v) \qquad -①$$

Similarly using other equation we get →

$$G_2(u,v) = F_2(u,v) + H_1(u,v) . F_1(u,v) \qquad -②$$

Solving ①, ② we get →

$$F_1(u,v) = \frac{G_1(u,v) - H_2(u,v) . G_2(u,v)}{1 - H_2(u,v) . H_1(u,v)} \qquad -③$$

$$F_2(u,v) = \frac{G_2(u,v) - H_1(u,v) . G_1(u,v)}{1 - H_1(u,v) . H_2(u,v)} \qquad -④$$

From F_1, F_2 we find $f_1(x,y)$ and $f_2(x,y)$ by taking inverse discrete fourier transform.

$$f_1(x,y) = \left(F^{-1}(F_1)\right)(x,y) \quad \text{and}$$

$$f_2(x,y) = \left(F^{-1}(F_2)\right)(x,y).$$

The problem with formulae 3, 4 are that in the denominator we have $1 - H_1(u,v) . H_2(u,v)$. As we know, for defocus blur we have $H_1(u,v) \propto e^{-\frac{(u^2+v^2)}{\sigma^2}}$ and same for $H_2(u,v)$ i.e both H_1, H_2 are low pass filters and have value close to 1 at low frequencies. Hence at ~~close~~ low frequencies the denominator is very close to 0. In fact at $u = v = 0$, denominator $= 0$ and we can't use this formula. Also, at points (u,v) in the low frequency, any noise (even if small) in the numerator will be blown to very high values since the denominator is close to 0 hence making these formulae unstable to noise.