5. We put the origin of a coordinate system at the lower left corner of the square and take $+x$ rightward and $+y$ upward. The force exerted by the charge $+q$ on the charge $+2q$ is

$$\vec{F}_1 = k\frac{q(2q)}{a^2}\,(-\hat{\jmath}) \ .$$

The force exerted by the charge $-q$ on the $+2q$ charge is directed along the diagonal of the square and has magnitude

$$F_2 = k\frac{q(2q)}{(a\sqrt{2})^2}$$

which becomes, upon finding its components (and using the fact that $\cos 45^\circ = 1/\sqrt{2}$),

$$\vec{F}_2 = k\frac{q(2q)}{2\sqrt{2}\,a^2}\,\hat{\imath} + k\frac{q(2q)}{2\sqrt{2}\,a^2}\,\hat{\jmath} \ .$$

Finally, the force exerted by the charge $-2q$ on $+2q$ is

$$\vec{F}_3 = k\frac{(2q)(2q)}{a^2}\,\hat{\imath} \ .$$

(a) Therefore, the horizontal component of the resultant force on $+2q$ is

$$\begin{aligned} F_x &= F_{1x} + F_{2x} + F_{3x} = k\frac{q^2}{a^2}\left(\frac{1}{\sqrt{2}} + 4\right) \\ &= \left(8.99 \times 10^9\right)\frac{\left(1.0 \times 10^{-7}\right)^2}{0.050^2}\left(\frac{1}{\sqrt{2}} + 4\right) = 0.17 \text{ N} \ . \end{aligned}$$

(b) The vertical component of the net force is

$$F_y = F_{1y} + F_{2y} + F_{3y} = k\frac{q^2}{a^2}\left(-2 + \frac{1}{\sqrt{2}}\right) = -0.046 \text{ N} \ .$$