Concept Question 11-5: How do we estimate image vectors $\mathbf{f}_k[n, m]$ from the training image vectors $\mathbf{f}_k^{(i)}[n, m]$?

By taking their sample means. See Eq. (11.45). This is implemented in Eq. (11.64) and Eq. (11.65) for an example.

$$\overline{f}_{k,\mathrm{R}}[n,m] = \frac{1}{I} \sum_{i=1}^{I} f_{k,\mathrm{R}}^{(i)}[n,m] \qquad (11.45)$$