Step-1

(a) Expected error $E(e)=\frac{1}{2}(-2)+\frac{1}{4}(-1)+\frac{1}{4}(5)=0$

Hence expected error is zero.

The variance $\sigma_1{}^2=E\left(e^2\right)$

$$=\frac{1}{2}(-2)^2+\frac{1}{4}(-1)^2+\frac{1}{4}(5)^2$$

$$=2+\frac{1}{4}+\frac{25}{4}$$

$$=\frac{34}{4}$$

Â $=\boxed{\frac{17}{2}}$

Step-2

(b) Expected error $E(e)=\frac{1}{8}(-1)+\frac{6}{8}(0)+\frac{1}{8}(1)$

$$=0$$

So, expected error is zero.

The variance $\sigma_2{}^2=E\left(e^2\right)$

$$=\frac{1}{8}(-1)^2+\frac{6}{8}(0)^2+\frac{1}{8}(1)^2$$

$$=\frac{1}{4}$$

Weight $w_1=\frac{1}{\sigma_1}$

$$=\boxed{\sqrt{\frac{2}{17}}}$$

Weight $w_2=\frac{1}{\sigma_2}$

$= \sqrt{4}$

$= \boxed{2}$