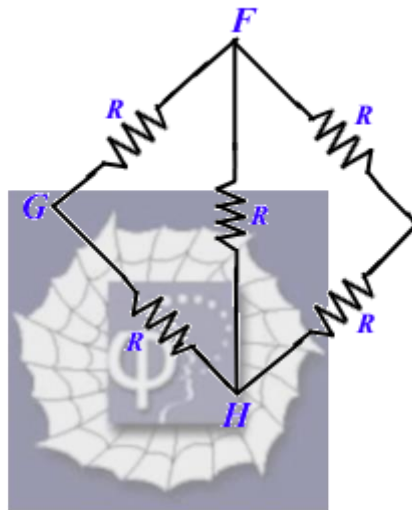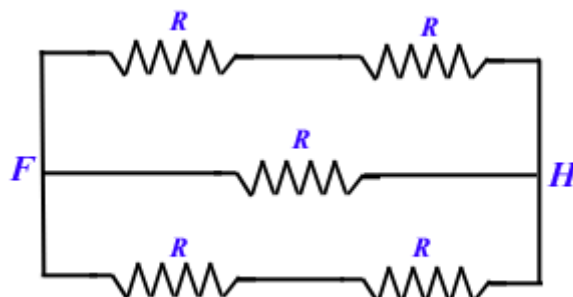**409.**

Problem 33.27 (RHK)

In the circuit shown in the figure, we have to find equivalent resistance between the points (a) *F and H and* (b) *F and G.*

Solution:

(a)

For calculating the equivalent resistance between points *F* and *H*, we redraw the circuit as below

The equivalent resistance between F and H is the resultant of resistances, $2R$, R and $2R$ connected in parallel. Therefore,
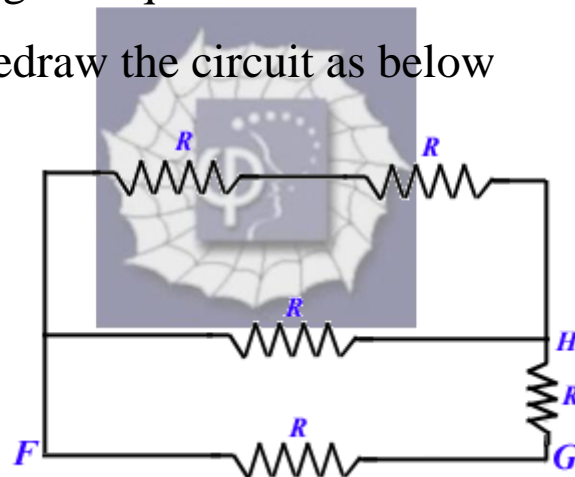
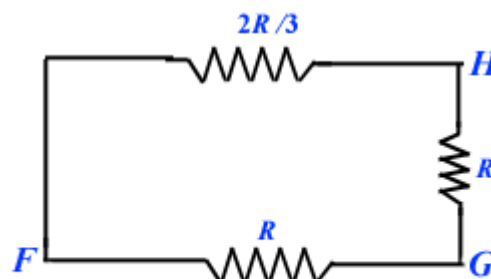$$\frac{1}{2R_{FH}} = \frac{1}{2R} + \frac{1}{R} + \frac{1}{2R} = \frac{2}{R},$$

or

$$R_{FH} = \frac{R}{2}.$$

(b)

For calculating the equivalent resistance between points F and G we redraw the circuit as below

It is equivalent to the circuit below

Therefore, the equivalent resistance between F and G is

$$\frac{1}{R_{FG}} = \frac{1}{5R/3} + \frac{1}{R},$$

or

$$R_{FG} = \frac{5R}{8}.$$