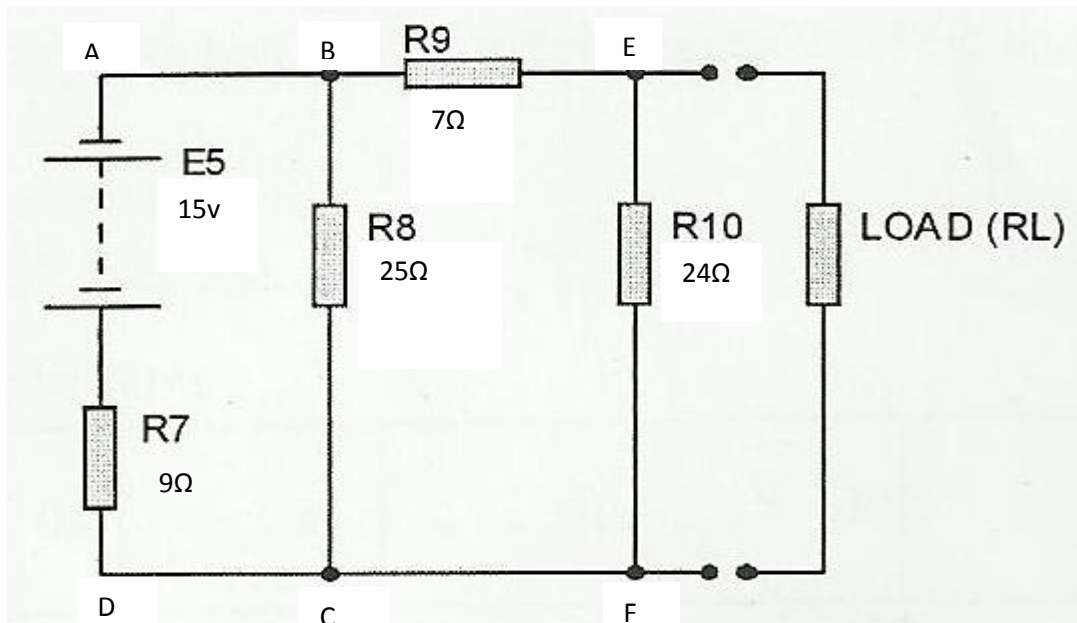Task Two
Kirchoffs Law

For the circuit shown using Kirchoff's laws and Max Power theorem, calculate the value of load for maximum power transfer.



**Loop A B C D**

$15v = 9\Omega I_1 + 25\Omega (I_1 - I_2)$

$15v = 10\Omega I_1 + 25\Omega I_1 - 25\Omega I_2$

$15v = 34\Omega I_1 - 25\Omega I2$ --------- ①

**Loop B E F C**

$0v = 7\Omega I_2 + 25\Omega (I_2 - I_1) + 24\Omega I_2$

$0v = -25\Omega I_1 + 56\Omega I_2$ -------------- ②

$15v = 34\Omega I_1 - 25\Omega I2$ -------------- ① x25

$0v = -25\Omega I_1 + 56\Omega I_2$ -------------- ② x 34

$375v = 850\Omega I_1 - 625\Omega I_2$

$0v = -850\Omega I_1 + 1904\Omega I_2$

$375v = 1279\Omega I_2$

$$I_2 = \frac{375v}{1279\Omega} = 0.293a$$

**Sub $I_2$ in to equation ①**

$15v = 34\Omega I1 - 25\Omega I_2 (0.293a)$

$15v = 34\Omega I_1 + 0.692a$

$15v + 0.692a = 34\Omega I_1$

$$I_1 = 15v + \frac{0.293a}{15v} = 15.02$$

$RL = I_1 + I_2 = 0.293a + 15.02 = 15.31a$

$RL = 15.03a$