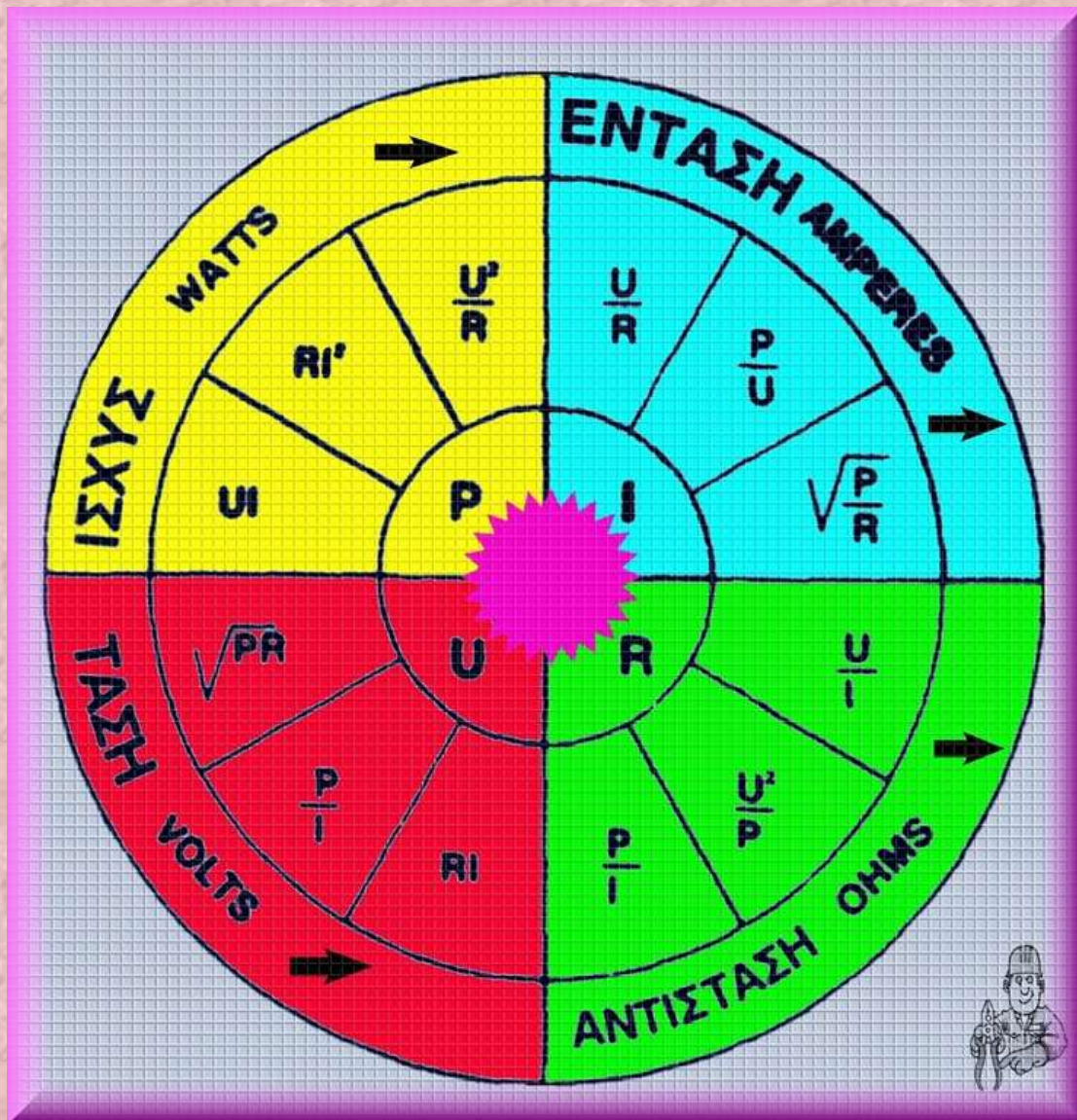


# Φυσική Γενικής Παιδείας Β' Λυκείου

## Τράπεζα Θεμάτων



Φώτης Μπαμπάτσικος

# **Συνεχές Ηλεκτρικό ρεύμα**

## **Δ Θέμα**

**μ**

**μ**

**4\_15559**

2,4 .

1)  $R_1 = 6 \Omega$  .

$R_2$  (2).

$\epsilon = 30 \text{ V}$  .

2)  $(r = 0)$  .

$\epsilon = 48 \text{ V}$  .

3)  $r = 0,6 \Omega$  .

$S = 25 \cdot 10^{-8} \text{ m}^2$  .

$= 2 \cdot 10^{-8} \cdot \text{m}$  .

4)  $R_2$  .

**4\_15557**

$r = 2 \Omega$  .

$R_1 = 8 \Omega$  ,  $R_2 = 4 \Omega$  ,  $R_3 = 4 \Omega$  .

1)  $9 \text{ A}$  .

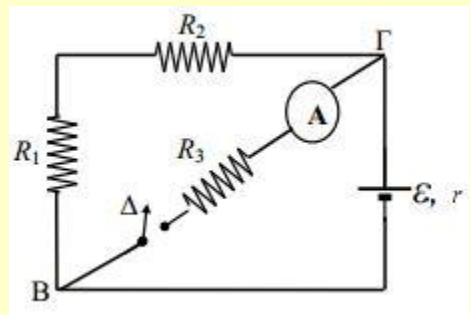
$V_B$  .

2)  $Q$  .

3)  $Q$  .

$t = 2 \text{ s}$  .

4) .

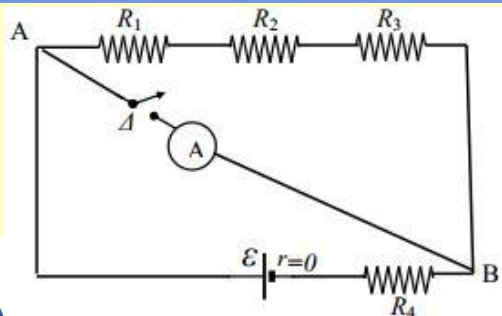


**4\_15556**

$\epsilon = 60 \text{ V}$  .

$R_1 = R_2 = 10 \Omega$  .

$R_3 = R_4 = 5 \Omega$  .

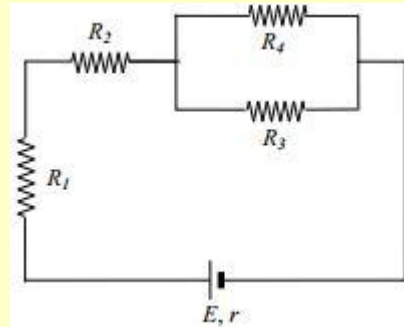




4)  $\mu$  ,  $\mu$  R , 96 ; 6

4\_15550

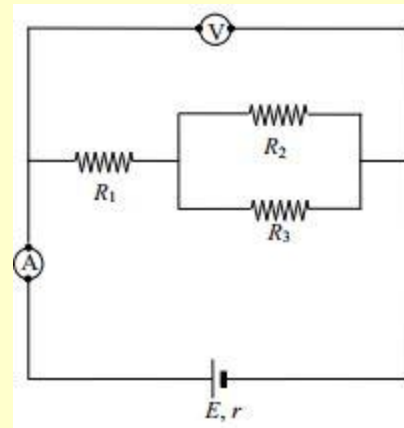
$R_1, R_2, R_3, R_4$   $\mu$   $\mu$  100 , 100 ,  
 200 200  $\mu$  = 62 V  
 $r = 10$  .



- 1)  $\mu$  . 6
- 2)  $\mu$  . 6
- 3)  $\mu$   $\mu$   $\mu$   $R_3$ . 8
- 4)  $\mu$   $\mu$   $\mu$   $\mu$   $R_3$ . 5

4\_15548

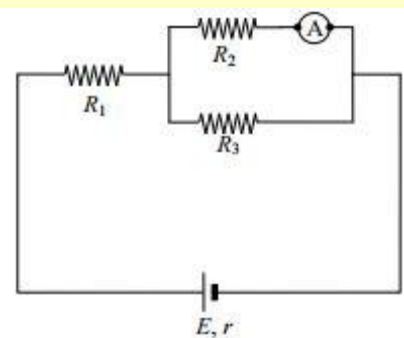
$\mu$   $\mu$   $\mu$   $\mu$  ,  $V = 60$  V  
 $I = 2$  A.  
 $R_1 = 20$   $R = 20$   $\mu$  ,  $r = 1$   
 1)  $\mu$  :  $\mu$



- 1)  $\mu$  6
- 2)  $\mu$   $\mu$  . 8
- 3)  $\mu$   $\mu$   $R_3$ . 8
- 4)  $\mu$  . 5

4\_15547

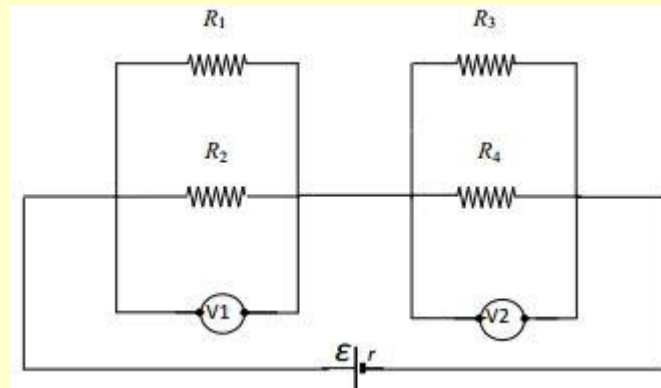
$R_2 = 10$   $R_3 = 40$   $R_1 = 10$  ,  
 $\mu$   $\mu$   $\mu$  . T  
 $2$  A,  $r = 2$   $\mu$  .



- 1)  $R_2$  5
  - 2) 2 s.  $\mu$  8
  - 3) . 6
  - 4)  $\mu$  . 6
- $R_1$   $\mu$  2 min. 6

4\_15546

$R_1 = 6 \Omega$ ,  $R_2 = 6 \Omega$ ,  $R_3 = 3 \Omega$ ,  $R_4 = 6 \Omega$



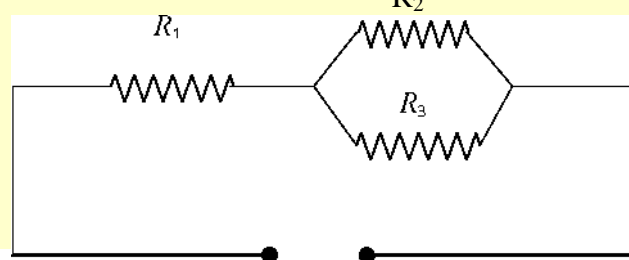
- 1)  $I = 0,09 \text{ A}$
- 2)  $V_1 = 3 \text{ V}$ ,  $V_2 = 3 \text{ V}$
- 3)  $N = 0,09 \text{ W}$
- 4)  $W = 24 \text{ kWh}$

4\_15545

- $L = 1 \text{ km}$ ,  $V = 60 \text{ V}$ ,  $0,05 \text{ } \Omega/\text{m}$
- 1)  $R = 50 \Omega$
  - 2)  $R = 300 \text{ m}$
  - 3)  $t = 10 \text{ min}$
  - 4)  $W = 40\% \text{ kWh}$ ,  $W = 50\% \text{ kWh}$

4\_15544

- $R_1 = 30 \Omega$ ,  $R_2 = R_3 = 40 \Omega$ ,  $V = 10 \text{ V}$
- 1)  $I = 0,1 \text{ A}$





2)  $\mu$   $\mu$  (4)  $0 \text{ C}$   $\mu$   $R_{4,0} = 100 \text{ } \mu$  .  $\mu$

4)  $\dot{C}$   $\mu$  (4). 7

4\_15538

$R_1 = 3 \text{ } \mu$  ,  $R_2 = 6 \text{ } \mu$   $R_3 = 8 \text{ } \mu$  .  $\mu$

$\mu = 120 \text{ V}$   $\mu$

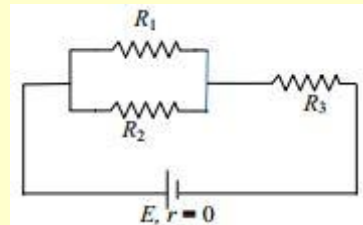
1)  $\mu$   $\mu$  5

2)  $\mu$   $\mu$  6

3)  $\mu$   $\mu$  8

4)  $R_1$   $\mu$  « »  $R_2$  6

10 min. 6



4\_15536

(1), (2), (3)  $\mu$   $\mu$   $\mu$   $R_1 = 1 \text{ K}$  ,  $R_2 = 2 \text{ } \mu$   $R_3 = 6 \text{ } \mu$  .

$\mu$   $\mu$   $\mu$   $\mu$  (1)  $12 \cdot 10^{18}$   $\mu$

(2)  $\mu$   $\mu$  2 min. (1)  $\mu$  (3).  $\mu$

$\mu$   $\mu$  ,  $\mu$  ,  $\mu$  .

$|e| = 1,6 \cdot 10^{-19} \text{ C}$  .

1)  $\mu$   $\mu$  5

2)  $\mu$   $\mu$   $R_1$  6

3)  $\mu$   $\mu$   $R_2$  8

4)  $\mu$   $\mu$  ; 6

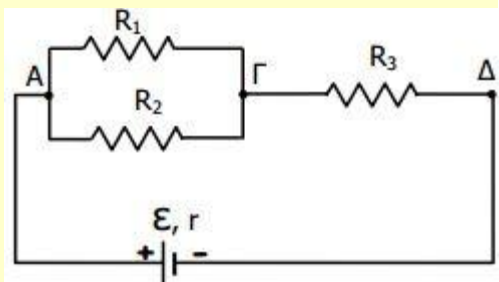
4\_15533

$V_A = 12 \text{ V}$  ,  $R_2 = 6 \text{ } \mu$   $R_3 = 7 \text{ } \mu$  .

$\mu$   $\mu$   $\mu$   $\mu$  :  $\mu$  :  $\mu$  :

1)  $\mu$   $\mu$   $\mu$  6

2)  $\mu$   $\mu$   $R_1$  7

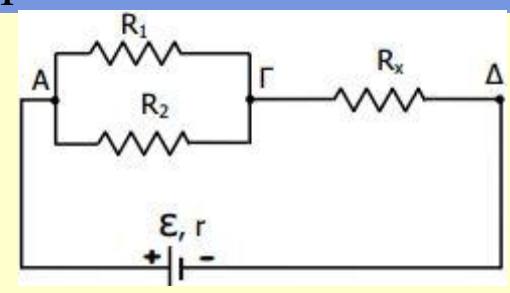




3) 10 min. μ 5  
 4)  $R_2$  μ ,  
 $R_1$  μ .  
 μ 2 ; 7

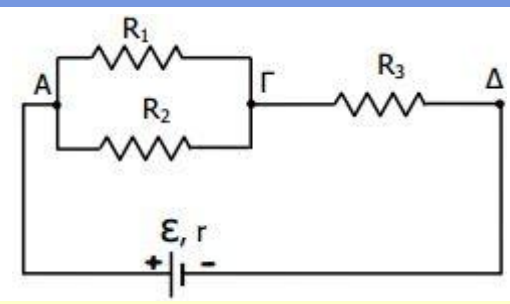
4\_15531

$R_1 = 12$   $R_2 = 6$  μ :  
 : = 36 V  $r = 1$  μ :  
 1) μ  $R_x$  6  
 μ μ 11 .  
 2) 7  
 3) μ . 5  
 4)  $R_2$  μ ,  
 $R_1$  μ . μ 2  
 ; 7



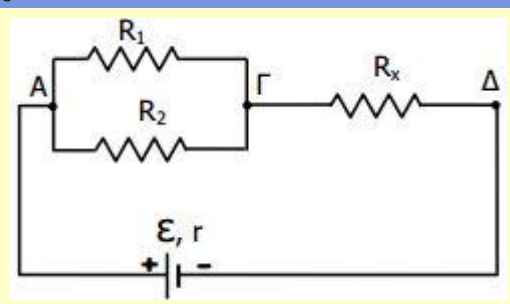
4\_15530

$R_1 = 12$  ,  $R_2 = 6$   $R_3 = 7$  μ :  
 = 36 V  $r = 1$  μ :  
 1) μ 6  
 2)  $R_1$  7  
 3) 10 min. μ 5  
 4)  $R_2$  μ ,  
 $R_1$  μ . μ 2  
 ; 7



4\_15530

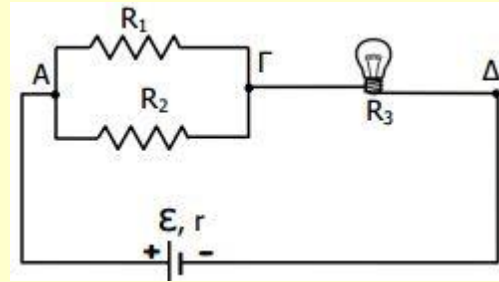
$R_1 = 12$   $R_2 = 6$  μ :  
 = 36 V  $r = 1$  μ :  
 1) μ  $R_x$  6  
 μ μ 11 .  
 2)  $R_1$  μ . 6  
 3) 10 min. μ 5





4\_15526

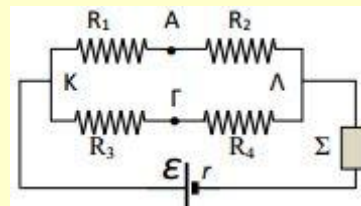
$R_1 = 120 \text{ } \mu$  ,  $R_2 = 60 \text{ } \mu$  ,  $R_3 = 400 \text{ } \mu$  :  
 (  $R_3$   $\mu$  ).  
 $V_K = 200 \text{ V.}$  :  $P_K = 100 \text{ W}$   
 $r = 0 \text{ } \mu$  :  $= 220 \text{ V}$



- 1)  $\mu$  . 6
- 2)  $\mu$  . 6
- 3)  $R_2$   $\mu$  . 6
- 4)  $\mu$  10 min. 6
- $R_2$   $\mu$  , 7
- ( )  $\mu$  .
- ( ) .
- ( )  $R_2$  .

4\_15525

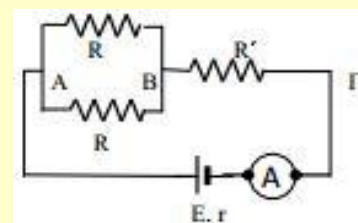
$R_1 = R_4 = 10 \text{ } \mu$  ,  $R_2 = R_3 = 5 \text{ } \mu$  ,  $= 24 \text{ V.}$   $\mu$  :  
 $5 \text{ V, } 10 \text{ W}$   $\mu$  .  
 $\mu$   $\mu$  :



- 1)  $\mu$  . 7
- 2)  $\mu$  . 6
- 3)  $\mu$   $R_1$   $R_3$  . 6
- 4)  $\mu$   $V_A - V$  . 6

4\_15524

$\mu$   $\mu$   $\mu$  ,  $R$   $\mu$  :  
 $R \mu$  ,  $\mu$   $\mu$  .  
 $\mu$   $\mu$  .  
 $r = 0,5 \text{ } \mu$  .  $= 3,1 \text{ V}$   $\mu$  .  
 $\mu$   $\mu$  0,2 .  $\mu$



- 1)  $\mu$  . 6



4) (1), 1980 J 6

$R_1 = 100$

$R_2 = 25$

$R_3 = 100$

$S = 10^{-6} \text{ m}^2$

$E = 210 \text{ V}$

$320 \text{ J/s}$

1) 6

2) 5

3) 7

4)  $Q_1 = 10.000 \text{ J}$  7

$R_2$

4\_15516 (50W ,

50V) 1 (25W , 50V) 2.

$I = \frac{2}{3} \text{ A}$

1) 6

2) 6

3) 7

4) 0,8KWh. 6

4\_15514

$R_1 = 9$  ,  $R_2 = 18$

$R_3 = 3$

	$r.$	$\mu$	$R_2$
1)	$2 = 1$	$\mu$	$R_3.$
2)			6
3)	$\mu$	$R_1, R_2$	$R_3.$
		$I = 12A,$	6
4)	$\mu$	$\mu$	$\mu .$
	$10,8 \text{ KWh.}$	$\mu$	$\mu$
			6

**4\_15513**

	$\mu$	$R_1 = 10$	$R_2 = 20$	$\mu$
	$\mu$	$\mu$	$P = 30 \text{ W}, V_K = 30 \text{ V.}$	$\mu$
	$\mu$	$r = 3$	$\mu$	$\mu$
1)	$\mu$	$\mu$	$\mu$	6
2)	$\mu$	$\mu$	$\mu$	6
3)	$\mu$	$\mu$	$16 \text{ s.}$	6
4)	$\mu$	$\mu$	$\mu$	6
	$\mu$	$\mu$	$R_3 = 120$	7
			$ q_e  = 1,6 \cdot 10^{-19} \text{ C.}$	

**4\_15511**

	$\mu$	$R_1 = 2$	$R_2 = 5$	$R_3 = 10$
	$\mu$	$\mu$	$\mu$	$\mu$
	$\mu$	$= 12 \text{ V}$	$r.$	$5$
	$\mu$	$\mu$	$1,5$	$\mu$
1)	$\mu$	$\mu$	$\mu$	5
2)	$\mu$	$\mu$	$\mu$	7
3)	$\mu$	$\mu$	$\mu$	7
4)	$\mu$	$\mu$	$\mu$	6

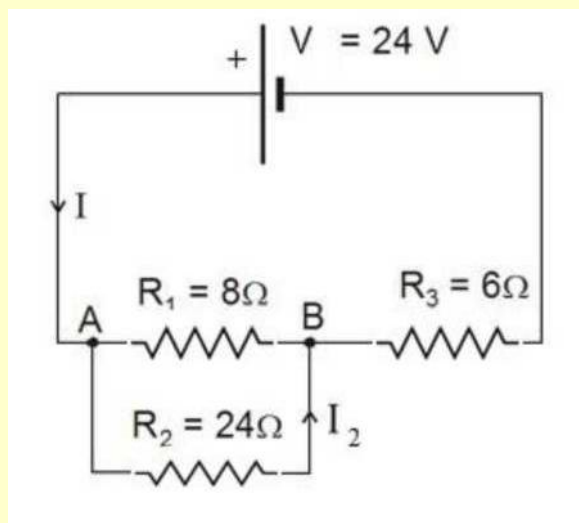
**4\_15519**

	$\mu$	$\mu$	$R = 3,5$	$\mu$
	$\mu$	$\mu$	$1 = 1,2$	$\mu$
	$\mu$	$\mu$	$R_2 = 8,5$	$\mu$
	$2 = 0,6$	$r.$	$\mu$	$\mu$
1)	$\mu$	$\mu$	$\mu$	$\mu$

4  
2)  $\mu$   
8  
3)  $\mu$ ,  $\mu$   $\mu$   $\mu$   $R_3 = 1,5$   
4)  $V - I$   $\mu$   $\mu$   $\mu$  ( $\mu$   $\mu$   $\mu$   $\mu$  S.I)  $\mu$  7

4\_15460

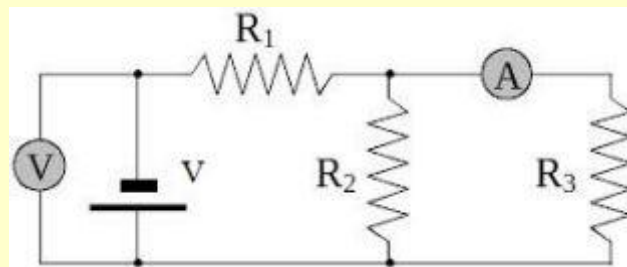
$\mu$   $\mu$   $V = 24 V$   
 $R_1 = 8$ ,  $R_2 = 24$   $R_3 = 6$



- 1)  $\mu$   $\mu$   $\mu$  5
- 2)  $\mu$   $R_3$ . 5
- 3)  $\mu$   $\mu$   $R_2$ . 7
- 4)  $\mu$   $R_1$ , 20 min.  $\mu$  8

4\_15457

$\mu$   $\mu$   $14 V$   
 $R_1 = 5$ ,  $R_2 = 3$   $R_3 = 6$   $\mu$   $\mu$   $\mu$



- 1)  $\mu$   $\mu$  5
- 2)  $\mu$   $R_1$ . 5
- 3)  $\mu$   $\mu$   $\mu$  7

4)  $\mu$   $R_2$ , 10 min.  $\mu$  8

4\_15456

$\mu$   $\mu$   $25 \text{ W}$ .  $\mu$

1)  $\mu$   $R_1$   $\mu$

$\mu$   $25 \text{ W}$   $\mu$  ,

$\mu$   $8$  .

2)  $\mu$   $\mu$  ,

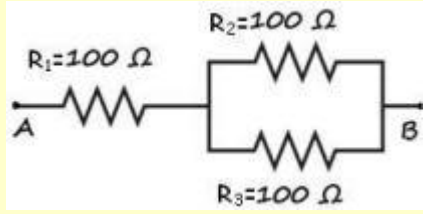
3)  $R_1$   $\mu$   $\mu$  .  $\mu$  7

4)  $\mu$   $\mu$   $8 \text{ h}$ .  $\mu$  kWh 5

0,8 €

4)  $\mu$   $\mu$   $E = 76 \text{ V}$   $\mu$

2.  $\mu$  , ,  $\mu$  5

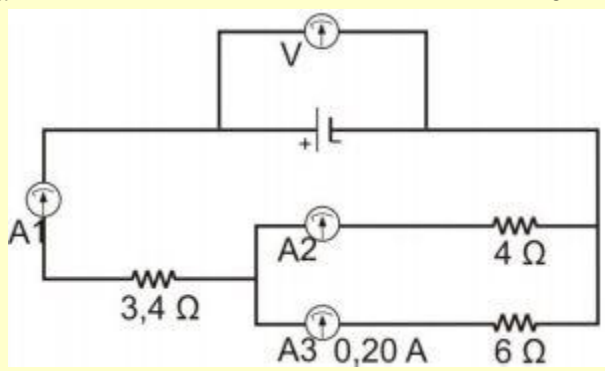


4\_15455

T  $\mu$   $\mu$   $\mu$   $\mu$   $\mu$  .  $\mu$  ,

$\mu$   $\mu$   $\mu$  ,

1)  $\mu$   $\mu$  6 4



2)  $\mu$   $\mu$  2. 5

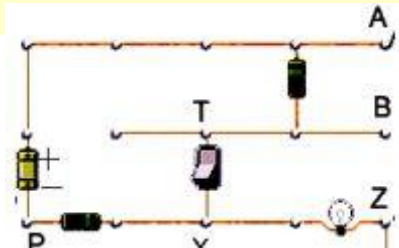
3)  $\mu$   $\mu$  1  $\mu$  8

4)  $\mu$   $\mu$   $\mu$   $\mu$  1.  $\mu$  8

$\mu$  1 h. 8

4\_15454

$\mu$   $\mu$   $\mu$





$E = 60 \text{ V}$ ,

$12 \text{ V} / 24 \text{ W}$ .

1)  $\dots$

2)  $\dots$  5

3)  $\dots$  7

4)  $\dots$  kWh  $30 \dots$  0,1 €/kWh.  $R_1$  25% 6 7

**4\_15449**

$R_1 = R_2 = 10 \dots$

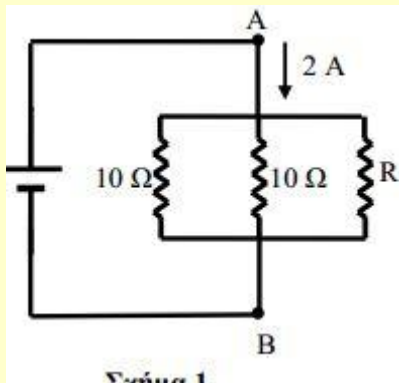
$8 \text{ V} \dots V_{AB} = 2 \dots$

1)  $\dots$  5

2)  $\dots R \dots$  7

3)  $\dots$  5

4)  $\dots 2/3 \dots$  8



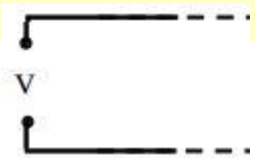
Σχήμα 1.

**4\_15448**

$V = 220 \text{ V}$   $110 \text{ W}$   $1100 \text{ W}$

$R = 22 \dots$

1)  $\dots$







$V_K = 9 \text{ V}$

$R_1 = 20$       $R_2 = 5$   
 $P_K = 27 \text{ W}$

- 1) 6
- 2) 6
- 3) 7
- 4)  $R_3$ , 3 W. 6

4\_15387

$R_1 = 2$  ,  $R_2 = 4$  ,  $R_3 = 3$  ,  
 $R_4 = 7$

$r = 1$

- 1) 5
- 2) 7
- 3) 8
- 4) 5

4\_15385

$R_3 = 7$

$R_1 = 8$       $R_2 = 8$  ,  
 $= 24 \text{ V}$

- 1) 4
- 2) 12
- 3) 7

4)  $\mu$  5 min.  $\mu$  (2) 7

**4\_15382**

$R_1 = 10 \mu$ ,  $R_2 = 10 \mu$ ,  $R_3 = 20 \mu$ . (1) (2) (3),  
 $r = 2 \mu$ .  
 1)  $\mu$  4  
 2)  $\mu$  6  
 3)  $\mu$  0,5 9  
 4) (3). 6

**4\_15381**

$R_1 = 4 \mu$ ,  $R_2 = 4 \mu$ ,  $R_3 = 5 \mu$ .  
 $R_1, R_2, R_3 = 24 V$ .  
 $r = 1 \mu$ .  
 1)  $\mu$  4  
 2)  $\mu$  6  
 3)  $\mu$  7  
 4)  $R_1$  8

**4\_15377**

$R_1 = 2 \mu$ ,  $R_2 = 4 \mu$ ,  $R_3 = 3 \mu$ .  
 $R_1, R_2, R_3 = 18 V$ .  
 $r = 1 \mu$ .  
 1)  $\mu$  4  
 2)  $\mu$  6  
 3)  $\mu$  7  
 4)  $R_1$  8  
 t = 2 min.

**4\_15376**

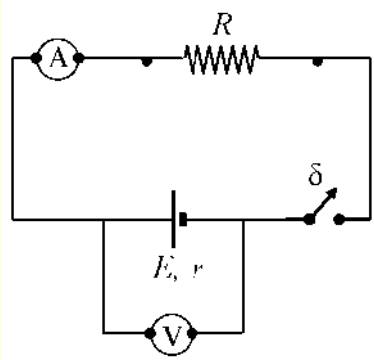
$P_1 = P_2 = 12 W$ ,  
 $V_1 = 12 V$ ,  $V_2 = 6 V$ .  
 $r$ .  $\mu$



$R_1 = 30 \Omega$ ,  $R_2 = 60 \Omega$ ,  $R_3 = 8 \Omega$ ,  
 $V_1, V_2$  are voltmeters.  
 $V_1 = 6 \text{ V}$ .  
 $V_2 = 1,6 \text{ V}$ .  
 1)  $I = 0,2 \text{ A}$   
 2)  $R_3 = 5 \Omega$   
 3)  $I = 5 \text{ A}$   
 4)  $P = 0,3 \text{ W}$ ,  $V = 3 \text{ V}$ ,  $R_3 = 8 \Omega$

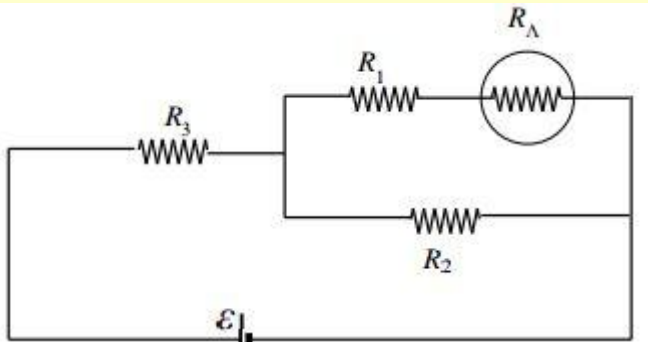
**4\_15363**

$R = 6 \Omega$ ,  $r = 5 \Omega$ ,  $E = 6 \text{ V}$ ,  $I = 0,5 \text{ A}$ .  
 1)  $R = 6 \Omega$   
 2)  $R = 6 \Omega$   
 3)  $R = 6 \Omega$   
 4)  $t = 100 \text{ s}$



**4\_15362**

$20 \text{ W}$ ,  $10 \text{ V}$ ,  $R_1 = 1 \Omega$ ,  $R_2 = 3 \Omega$ ,  $R_3 = 4 \Omega$ .



1)	$\mu$	$R$	6
2)	$\mu$	$\mu$	6
3)	$\mu$	$E = 18 \text{ V}$	6
4)	$\mu$	$\mu$	7

4_15360			
20 W	$\mu$	$\mu$	10 V /
	$\mu$	$R_1=1$ , $R_2=3$ , $R_3=4$	
1)	$\mu$	$R$	6
2)	$\mu$	$\mu$	6
3)	$\mu$	$E = 18 \text{ V}$	6
4)	$\mu$	$\mu$	7

4_15355			
	$\mu$	$R_1 = 2$	$\mu$
	$\mu$	$\mu$	10 V / 25 W
	$\mu$	$R_1$	$\mu$
	$\mu$	$\mu$	$R_2 = 3$
	$\mu$	$\mu$	$r = 3$
1)	$\mu$	$\mu$	6
2)	$\mu$	$\mu$	6
3)	$\mu$	$\mu$	6
4)	$\mu$	$\mu$	7

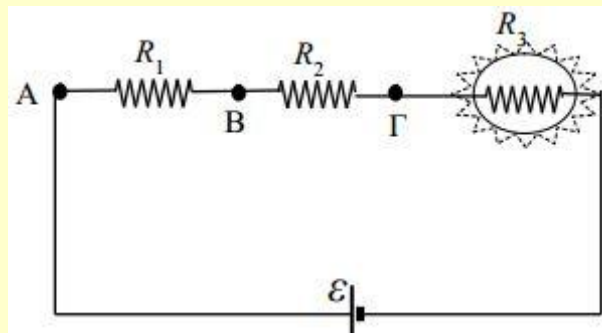
4_15352			
	$\mu$	$\mu$	10 V / 25 W,
	$\mu$	$\mu$	$R_1 = 4$
	$\mu$	$\mu$	$\mu$
	$\mu$	$E = 16 \text{ V}$	$\mu$
1)	$\mu$	$\mu$	6
2)	$\mu$	$\mu$	6



- 3)  $E = 6 \text{ V}$ ,  $R_1 = 2 \text{ }\Omega$ ,  $R_2 = 4 \text{ }\Omega$ ,  $R_3 = 6 \text{ }\Omega$ ,  $r = 1 \text{ }\Omega$ .  
 4)  $E = 16 \text{ V}$ ,  $R_1 = 2 \text{ }\Omega$ ,  $R_2 = 4 \text{ }\Omega$ ,  $R_3 = 6 \text{ }\Omega$ ,  $r = 1 \text{ }\Omega$ . 7

4\_15351

$R_1 = 2 \text{ }\Omega$ ,  $R_2 = 4 \text{ }\Omega$ ,  $R_3 = 6 \text{ }\Omega$ ,  $r = 1 \text{ }\Omega$ .  
 $E = 14 \text{ V}$ ,  $P_3 = 8 \text{ W}$ .



- 1)  $I = 1 \text{ A}$ ,  $P_3 = 6 \text{ W}$ . 6  
 2)  $I = 1 \text{ A}$ ,  $P_3 = 6 \text{ W}$ . 6  
 3)  $I = 1 \text{ A}$ ,  $P_3 = 6 \text{ W}$ . 6  
 4)  $I = 1 \text{ A}$ ,  $P_3 = 6 \text{ W}$ . 7

4\_15350

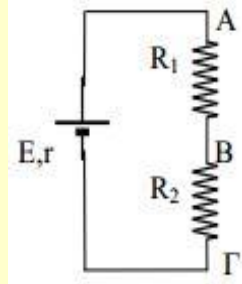
$E = 40 \text{ V}$ ,  $r = 1 \text{ }\Omega$ ,  $R_1 = 2 \text{ }\Omega$ ,  $R_2 = 4 \text{ }\Omega$ ,  $R_3 = 6 \text{ }\Omega$ ,  $R_4 = 8 \text{ }\Omega$ . «20V-80W».

- 1)  $I = 1 \text{ A}$ ,  $P_3 = 6 \text{ W}$ . 5  
 2)  $I = 1 \text{ A}$ ,  $P_3 = 6 \text{ W}$ . 5  
 3)  $I = 1 \text{ A}$ ,  $P_3 = 6 \text{ W}$ . 8



4\_15330

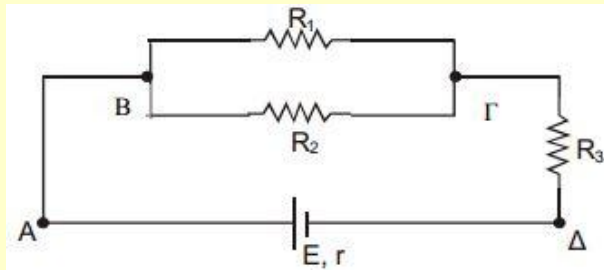
$R_1 = 3 \Omega$ ,  $R_2 = 6 \Omega$   
 $\mathcal{E} = 18 \text{ V}$   
 $r = 0 \Omega$



- 1)  $V_{AB} = ?$  5
- 2)  $\frac{V_{AB}}{V_{B\Gamma}} = ?$  6
- 3) Power in  $R_2$  is  $12 \text{ W}/24 \text{ W}$ . 7
- 4)  $P_{R_1} = ?$  7

4\_15328

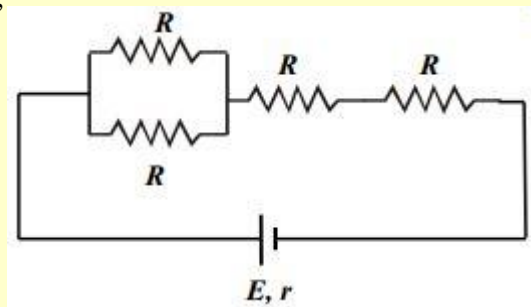
$r = 2 \Omega$   
 $R_1 = 6 \Omega$ ,  $R_2 = 6 \Omega$   
 $R_3 = 5 \Omega$



- 1)  $I = ?$  5
- 2)  $V_{B\Gamma} = ?$  6
- 3)  $Q = ?$  ( $t = 1 \text{ h}$ ) 8
- 4)  $P_{R_1} = ?$  6

4\_15326

$100 \text{ W}/20 \text{ V}$



- 1)  $I = ?$  6
- 2)  $P_{R_{parallel}} = ?$  6
- 3)  $Q = ?$  ( $t = 1 \text{ h}$ ) 6
- 4)  $P_{R_{series}} = ?$  6



0,1 €KWh 10

**4\_14734**

$\epsilon = 15 \text{ V}$ ,  
 $R_1 = 4 \quad R_2 = 2$   
 1)  $I = 2$  6  
 2)  $R_1, R_2$  6  
 2 min  $R_3 = 2$  6  
 3)  $R_1, R_2$  6  
 4)  $R_3$  7

**4\_21847**

$R_1=2 \quad R_2=4 \quad R_3=3 \quad R_4=8$   
 $V=10 \text{ V}$ .  
 1. 6  
 2. 6  
 3.  $R_4$  10 min 7  
 4.  $R_3$ ; 6

**4\_21841**

100 V, 200 W.  
 1) 6  
 $= 220 \text{ V}$   
 2)  $R$   $r = 10$  6  
 3) 6  
 4) 3%  $= 663 \text{ nm}$  7

Planck  $h = 6,63 \cdot 10^{-34} \text{ J}\cdot\text{s}$

$c_0 = 3 \cdot 10^8 \text{ m/s}$

**4\_21839**

- $R_1 = 3 \text{ } \Omega$      $R_2 = 6 \text{ } \Omega$      $R_3 = 1 \text{ } \Omega$      $R_4 = 6 \text{ } \Omega$   
 $V = 9 \text{ V}$
- 6
  - 6
  - $R_3$     10 min    7
  - $R_1$  ;    6

**4\_15321**

- $20 \text{ V}$
- 5
  - 6
  - 7
  - 7
- $t = 1 \text{ h}$   
 $R_1 = 10 \text{ } \Omega$  ,  $R_2 = R_3 = 5 \text{ } \Omega$  ,  $\mathcal{E} = 40 \text{ V}$  ,  $r = 1 \text{ } \Omega$  .

