

Circuits Test

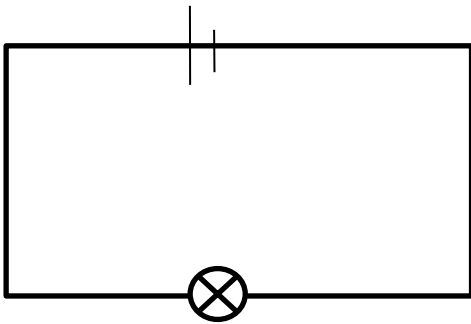
INFORMATION SHEET

- $R = \frac{V}{I}$
- $I = \frac{Q}{\Delta T}$
- $V = \frac{W}{Q}$
- $\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \dots$
- $R_s = R_1 + R_2 + \dots$
- $P = \frac{E}{\Delta t}$
- $P = VI$
- $P = \frac{V^2}{R}$
- $P = I^2 R$
- $E = VIt$
- $E = I^2 Rt$
- $E = \frac{V^2 t}{R}$
- $cost = amount kWh \times tariff$
- $EMK = I(R + r)$

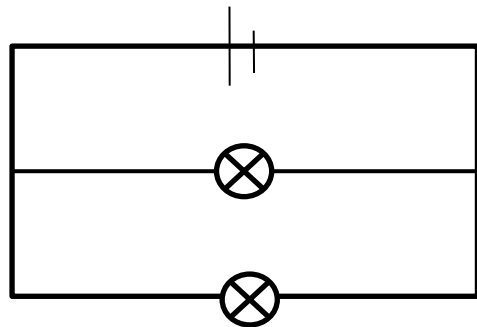
QUESTION 1:

CHOOSE ONLY A, B, C OR D

1.1) Consider the following two circuits. The main current in circuit 1 and current are the same. What will the power in circuit 2 be if all the resistances are identical in circuits 1 and 2? The EMK of every circuit is V-Volt.



Circuit 1

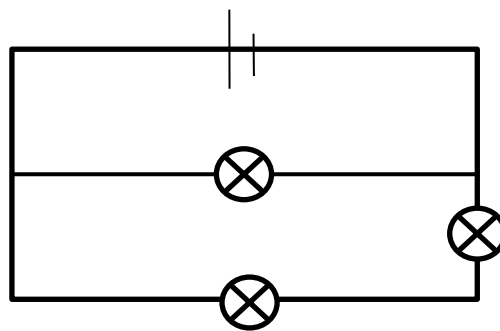


Circuit 2

- A.) P.
- B.) $\frac{1}{2}$ P.
- C.) 2P.
- D.) 3P.

(2)

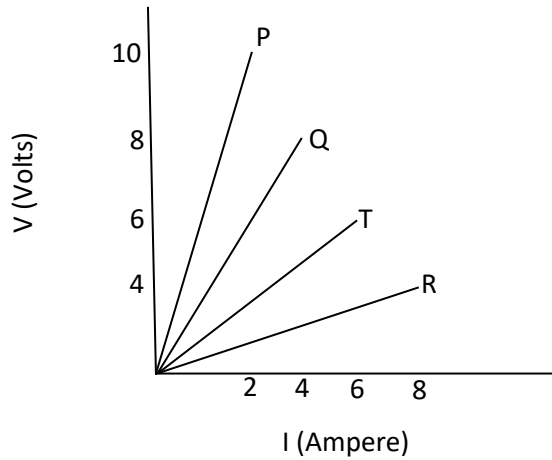
1.2) Consider the following circuit. Every resistance is R and the EMK of the battery is V-Volt. What is the correct equation for the Energy created in the circuit in 2 seconds?



- A.) $E = \frac{9I^2}{4}$
- B.) $E = 2R$
- C.) $E = 2VI^2R$.
- D.) None of the above.

(2)

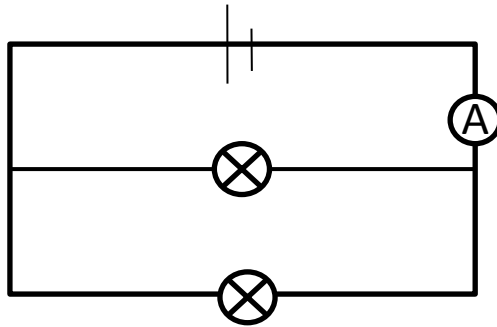
1.3) Consider the following diagram of Resistors. What is the order from small to big?



- A.) RTQP.
- B.) PQTR.
- C.) TQRP.
- D.) QRPT.

(2)

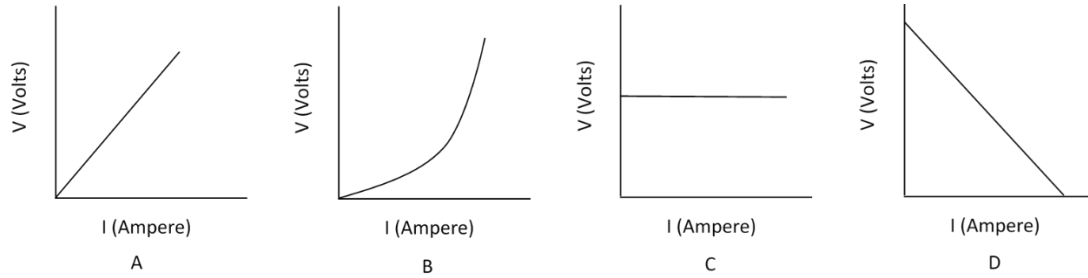
1.4) From question 1.3 the largest resistance is increased 3 times. The value of the largest resistance is the total resistance in the bottom circuit. The Ammeter reading is 3A. What is the correct equation for the internal resistance?



- A.) $R_{int} = \frac{45 - V_{eks}}{3}$
- B.) $R_{int} = \frac{V_{int}}{I_{Hfst}}$
- C.) A and B.
- D.) none of the above.

(2)

1.5) An Ohmic conductor will represent diagram...?

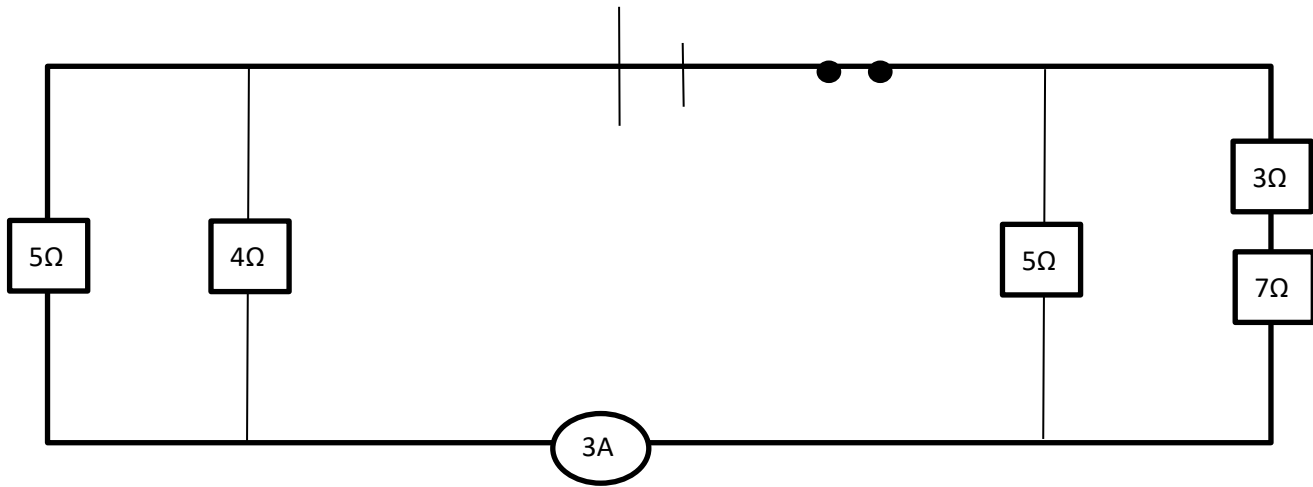


- A.) Diagram A.
- B.) Diagram B.
- C.) Diagram C.
- D.) Diagram D.

(5x2=10)

QUESTION 2:

Study the following circuit and answer the following questions.



- 2.1) Calculate the total resistance in the circuit. (5)
- 2.2) Another cell is added. How much volt will every cell deliver? (3)
- 2.3) Fully describe what will happen if another resistance is added to the parallel connection. (3)

QUESTION 3:

3.1) What is meant by 1kWh ? (2)

3.2) The cost of using an air conditioner for 30 days, 8 hours a day, at a tariff of R0,87 per kWh , is R551,23. The air conditioner is connected to a 220V power supply. Calculate how much current the air conditioner uses. (5)

3.3) Initially, when the switch was open, the current's reading was I_x . The switch is now closed and the current's reading is now I_y . What is the relation from I_x to I_y rounded off to the nearest whole number? (6)

