

ATTINGAL EDUCATIONAL DISTRICT

STANDARD 10 - PHYSICS

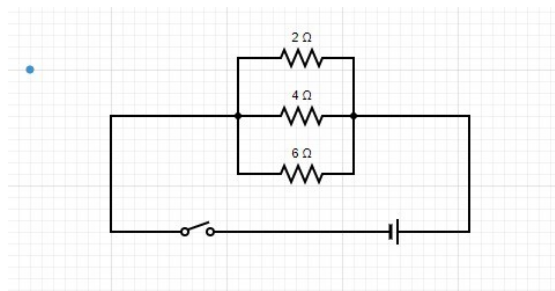
UNIT 1 – EFFECTS OF ELECTRIC CURRENT

EWS 1 – ANSWER KEY

1. Mechanical effect
2. $H = I^2Rt$
3. (a)
4. Heating effect
5.
 - a. Electrical energy to Light energy
 - b. Electrical energy to heat energy
6.
 1. Copper wires can be used for electrical transmission lines.
It has lower resistance than nichrome . So power loss in the form of heat is minimised.
 2. Nichrome wires can be used for electric heating appliances.
Due to its high resistance, large amount of heat is produced.
7.
 - a) joule
 - b) charge
8. Heater, Soldering iron, electric kettle, induction cooker
9.
 - a. Chemical energy
 - b. Mechanical energy
 - c. Mechanical effect
10.
 - a) Resistance, $R = V/I$
 $= 230 / 0.4$
 $= 575 \Omega$
 - b) Heat developed, $H = V I t$
 $= 230 \times 0.4 \times 10 \times 60$

$$= 55200\text{J}$$

11. a) Connect the resistances in series
 $R = r n = 6 \times 3 = 18 \Omega$
- b) Connect the resistances in parallel
 $R = r / n = 6 \div 3 = 2 \Omega$
12. a. Electric energy is converted into Heat energy
b. Heating coil
c. Nichrome
13. a. electric bulb
b. Electric energy to chemical energy.
c. The useful form of energy into which a device converts electrical energy, is considered as the effect of electric current on that device.
d. heating effect
14. a) $H = I^2 R t$
 $= 0.2 \times 0.2 \times 100 \times 2 \times 60$
 $= 480 \text{ J}$
- b) $H = 0.2 \times 0.2 \times 200 \times 2 \times 60$
 $= 960 \text{ J}$
- c) $H = 0.4 \times 0.4 \times 100 \times 2 \times 60$
 $= 1920 \text{ J}$
- When current is doubled, the heat is increased by four times.
15. a) Series connection, Parallel connection
b) If the resistors are connected in parallel,
Effective resistance, $1/R = 1/R_1 + 1/R_2 + 1/R_3 = \frac{1}{2} + \frac{1}{4} + \frac{1}{6} = \frac{11}{12}$
 $R = \frac{12}{11} = 1.09 \Omega$



c) $I = V/R$
 $= 6/2 = 3A$

16. a. Short Circuit and Overloading
b. In series
c. alloy of tin and lead
d. low melting point

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