**Basic Electricity and Electronics**

**Module One – Problem Worksheet Key**

1. A circuit has a 12 V power supply and a 1 kΩ resistor. What is the current?

**I = V/R = 12V divided by 1000Ω= .012 A or 12 mA**

1. A circuit has a 42 kΩ resistor and 8 mA of current. What is the voltage?

**V = I X R = .008 A X 42,000Ω = 336 V**

1. A circuit has 520 milli amps of current and 240 volts. What is the resistance?

**R = V/I = 240V divided by .52A = 461.5Ω**

1. A circuit has 470 kΩ and 16 V. What is the current?

**I = V/R = 16V divided by 470,000Ω = 0.000034 A = 34 μA**

1. I = 145 mA, R = 10 MΩ. V = ?

**V = I x R = .145 A X 10,000,000Ω = 1.45 MV**

1. In the following circuit calculate current and voltage drops.

R1 = 2 KΩ



**IT = 2 mA**

**V1 = 4V**

**V2 = 8V**

R2 = 4 KΩ

VS =12V

1. In the following circuit, calculate total current and total resistance.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  | R1 = |  | R2 = | **IT = 13.5 mA** |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | **RT = 1333Ω** |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| VS = |  |  |  | 2kΩ |  | 4kΩ |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| 18V |  |  |  |  |  |  |

1. In the following circuit, what is R1? R1

**R1 = 8 kΩ**

R2 = 4 KΩ

|  |  |  |
| --- | --- | --- |
| VS = | I = 1 mA |  |
| 12V |  |
|  |  |

VS =

18V

1. A power supply consumes 320 mW in order to supply 288 mW to the load. What is the efficiency?

**Eff = power out divided by power in = 288/320 = .9 = 90%**

10. What is R2 in the following circuit?

IT = 12 mA



|  |  |  |
| --- | --- | --- |
| R1 = | **R2 = 6 kΩ** |  |
| R2 = ? |  |
| 2kΩ |  |
|  |  |
|  |  |  |