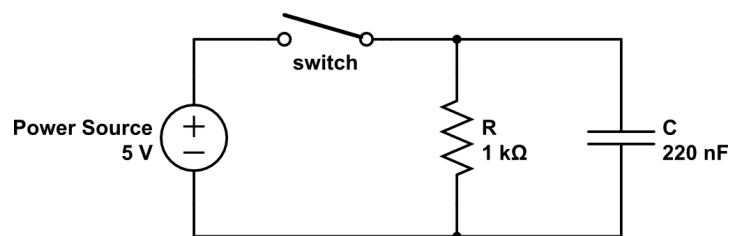


## Circuit Lab Answer Key

- |  |   |
|--|---|
| <p>1. _____ 267 <math>\Omega</math> _____ (3 points)</p> <p>2. _____ greater than _____ (1)</p> <p>3. _____ decrease _____ (1)</p> <p>4. _____ 2.25 V _____ (1)</p> <p>5. _____ <math>I_{R6} = \frac{1}{2} I_{R3}</math> _____ (1)</p> <p>6. _____ 50.6 mW _____ (2)</p> <p>7. _____ 1A _____ (2)</p> <p>8. _____ <math>I_{R1} = \pm(I_{R3} - I_{R2})</math> _____ (2)</p> <p>9. _____ 3 V _____ (2)</p> <p>10. _____ 14 V _____ (2)</p> <p>11. _____ 0 A _____ (1)</p> <p>12. _____ 220 <math>\mu</math>s _____ (2)</p> <p>13. _____ 220 nF _____ (2)</p> <p>14. _____ 5 mA _____ (2)</p> <p>15. Write answer below (5)</p> <p>16. _____ 23.5 <math>\mu</math>A _____ (1)</p> | <p>17. _____ 10.1 nF _____ (1)</p> <p>18. _____ 57.3 <math>\mu</math>A _____ (2)</p> <p>19. _____ slower _____ (1)</p> <p>20. <u><math>V_{C2}(t) = 2.84 + 3.04e^{-917t}</math></u> (5)</p> <p>21. _____ b _____ (2)</p> <p>22. _____ d _____ (2)</p> <p>23. _____ a _____ (2)</p> <p>24. _____ e _____ (2)</p> <p>25. _____ c _____ (2)</p> <p>26. _____ diode _____ (1)</p> <p>27. _____ <math>\infty \Omega</math> (infinite) _____ (2)</p> <p>28. _____ 0 <math>\Omega</math> _____ (2)</p> <p>29. _____ Ampere _____ (2)</p> <p>30. _____ Volt _____ (2)</p> <p>31. _____ tolerance _____ (2)</p> |
|--|---|

15. Circuit diagram:



32. What is the purpose of a Wheatstone Bridge? (3 points)

The Wheatstone Bridge allows measurement of an unknown resistance to a very high degree of precision. It uses a diamond shape, where one of the sides is an unknown resistance and the rest are known. The resistance can be found by measuring the current flow through the middle of the diamond when the sides are connected.

33. Define resistivity. (2 points)

Resistivity is a material property. It is the inverse of conduction and measures a material's resistance to the flow of electrons per unit length through a certain cross sectional area. Its units are ohm-meters.

34. Define drift velocity. (2 points)

Drift velocity is the overall speed and direction that electrons travel through a material, not including any components of movement perpendicular to the direction of motion. Current (measured in amperes), implicitly uses drift velocity when talked about in terms of the speed of electron flow.

**Note: Answers for the 2 Lab Stations are omitted. Answers were based upon the actual voltage of the 9V batteries used. Be aware that the circuits at both stations were built on a breadboard.**