PHYS 315 F 2015 Practice for Final

a. Ohm’s law: V=IR; b. Power = P = IV= I2R = V2/R

b. Series equivalent resistance (*Rs*) and parallel the equivalent resistance (*Rp*)are given by,

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1. Find the current delivered by the power source and the current through 1.2kΩ resistor.



  

2) Find the equivalent capacitance seen by the voltage source. Also find the charge on the 3 µF capacitor.



3. Find the current through the 4-Ω resistor, using the node-voltage method.

Diodes and Transistors (Si) $I\_{C}=βI\_{B}$ $r\_{e}=\frac{26 mV}{I\_{C}}$ $gain=-\frac{R\_{C}}{r\_{e}+R\_{E}}$ $V\_{BE}=0.7 v $

1. Determine the value of the load resistor.



2. What is the current in the circuit, shown below?


3. Calculate β.



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4. Calculate the following DC bias conditions: VB, VE, IE, IC, IB, VC, VCE, and the DC and ac gain.
(Assume that the transistor is a Si type, with β=150)



1. Find the gain for the following circuits:

|  |  |
| --- | --- |
| Inverting Amplifier Circuit.  Vin on the left connected to R1 connected to the negative terminal of the opamp connected to R2 connected to Vout and the output of the opamp.  Positive terminal of the opamp tied to ground. | Noninverting Amplifier circuit |
|  |  |

2. Calculate the output voltage if V1 = V2 = 0.15 V.



2. Calculate the output voltage if V1 = V2 = 700 mV.



PHYS 315 Op-amp Problems

1. Determine both the input and output voltage in this circuit:



1. Calculate the necessary resistor value (R1) in this circuit to give it a voltage gain of 30:



1. Calculate the output voltage, VO.



1. In the following circuit, if VO=-4.88 V, what is the value of R?



1. Consider the circuit shown in Figure 3. Find the value of voltage measured by the voltmeter. Determine the value of the power supplied by the op amp.



1. Calculate the output voltage, VO.



1. Calculate the output voltage, VO.

