FSK224.A1 - Electronics

R O Ocaya

Due: Friday, September 3^{rd}, 2010

1. a. Without using a center-tapped transformer, design a regulated 9V DC power supply with a 20:1 transformer. The mains voltage in Qwaqwa is 236V/50Hz.

   b. Plot a well-labeled diagram showing the input and output voltages across the transformer. Also, label the voltage of all the important nodes in the circuit.

   c. Derive an expression for the capacitance needed in the output filter. If the ripple voltage is to be less than 0.2V when the load current is 1200 mA, calculate the required capacitance in μF.

2. In Figure 1 the two have breakdown voltages of 5v1. The power transistor has a beta value of 30. If V_{CC} is 12V, R_L is 2Ω4 and the current through D_2 is 30mA, calculate V_L and R_S.

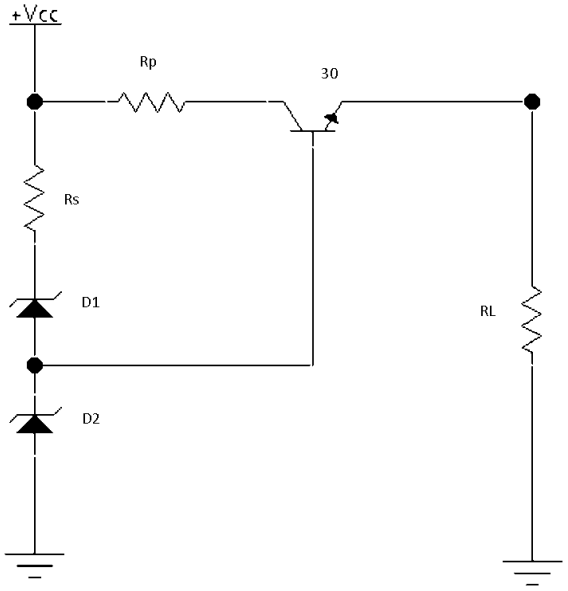

Figure 1: Transistor voltage regulator.