1) Answer the following questions with short, brief, and concise answers. Correct answers may be words, equations, graphs, or combinations as appropriate. (5 points each)

A) OrcAD may be used to determine the output response of a rectifier for different size combinations of resistive loads in parallel with a capacitor. Briefly discuss how you would set up the necessary analysis. Clearly indicating the simulation settings you would use if the input signal were a 5 kHz sine wave.

![Circuit Diagram]

B) A circuit consists of a DC voltage source connected in series with a diode, a resistor, and another diode such that the diodes are both forward biased. Briefly discuss the diode current and diode voltage relationships for this circuit if one diode has a reverse saturation current (I_s) value that is 100 times larger than the other diode. It appropriate you should explain why a relationship cannot be determined with the information given.

\[ I_s = I_{s1} + I_{s2} \]

C) Many BJT based amplifier designs are identified as “beta stable” circuits. Briefly describe/discuss the identification and why it is such a common design objective.

“Beta stable” means the operation of a BJT with different beta values has unchanged beta

D) The breakdown voltage is an important parameter for many circuits containing diodes. Briefly explain why this is an important parameter.

The diode is generally used to prevent current flow in one direction as a reverse voltage controlled switch. If the reverse voltage exceeds the breakdown rating the diode will no longer prevent current flow.