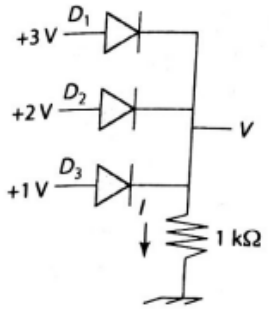
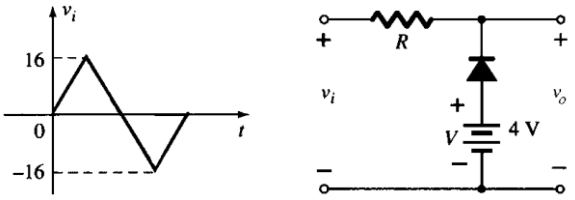
Assignment 2

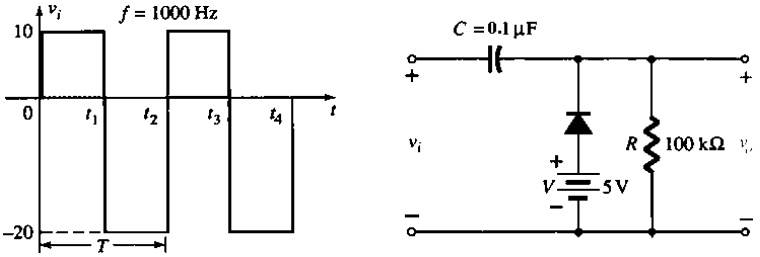
1. In the reverse bias region, the saturation current of a silicon diode is 0.1μA at T=20°C. Determine its approximate value if the temperature increased by 40°C.
2. Determine the voltage V and Current I in the below given circuit, assuming all silicon diodes are similar with 0.67 V forward barrier voltage.



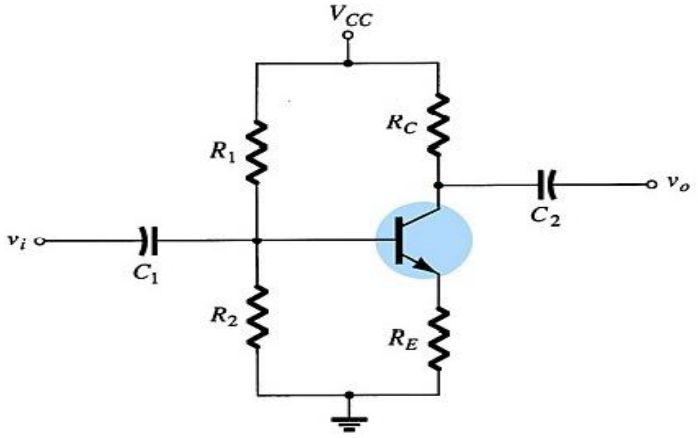
3. Determine and draw the v_o (output waveform) for the network shown below.



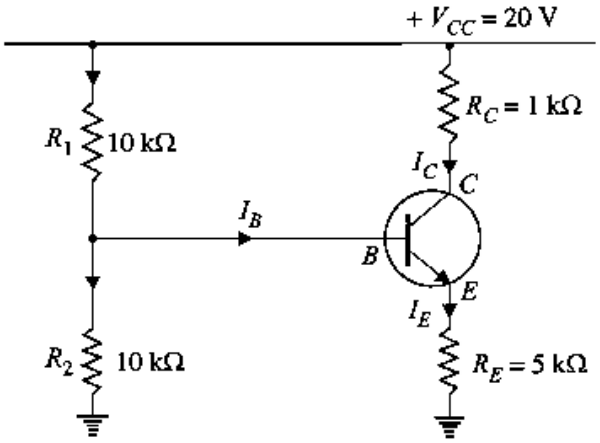
4. Determine and sketch the output waveform for the given circuit also explain both half cycle operations in detail.



6. Deduce the relation between current gain factors α and β.
7. Draw and discuss input and output characteristics of BJT CE amplifier.
8. For the given silicon-based CE amplifier, If the value of R_1=R_2=10 kΩ, R_c = 2 kΩ and R_E = 2 kΩ, V_{cc} = 12 Volts, β = 100. Draw the dc load line and find out I_{CQ} and V_{CEQ} at Q point.



9. Calculate the base current in the voltage divider circuit shown in Fig. Also find the value of V_{CE} and Ic. Assume the transistor is of silicon and the current amplification factor (β) is 50.



10. The Fig. shown below is BJT biasing with fixed bias method. (i) Determine the collector current Ic and collector-emitter voltage V_{CE}. Neglect small base-emitter voltage. Given that β = 50.