D. J. SANGHVI COLLEGE OF ENGINEERING
DEPARTMENT OF ELECTRONICS ENGINEERING
EXC402: DISCRETE ELECTRONIC CIRCUITS SEM IV
ASSIGNMENT 1

22^{nd} **February, 2017** **[Total Marks: 80]**

1. **Attempt all the questions.**
2. **Read the questions carefully before attempting.**

1. Derive the expression for small-signal hybrid π model parameters r_π, g_m and r_o for npn bipolar transistor. **[05]**

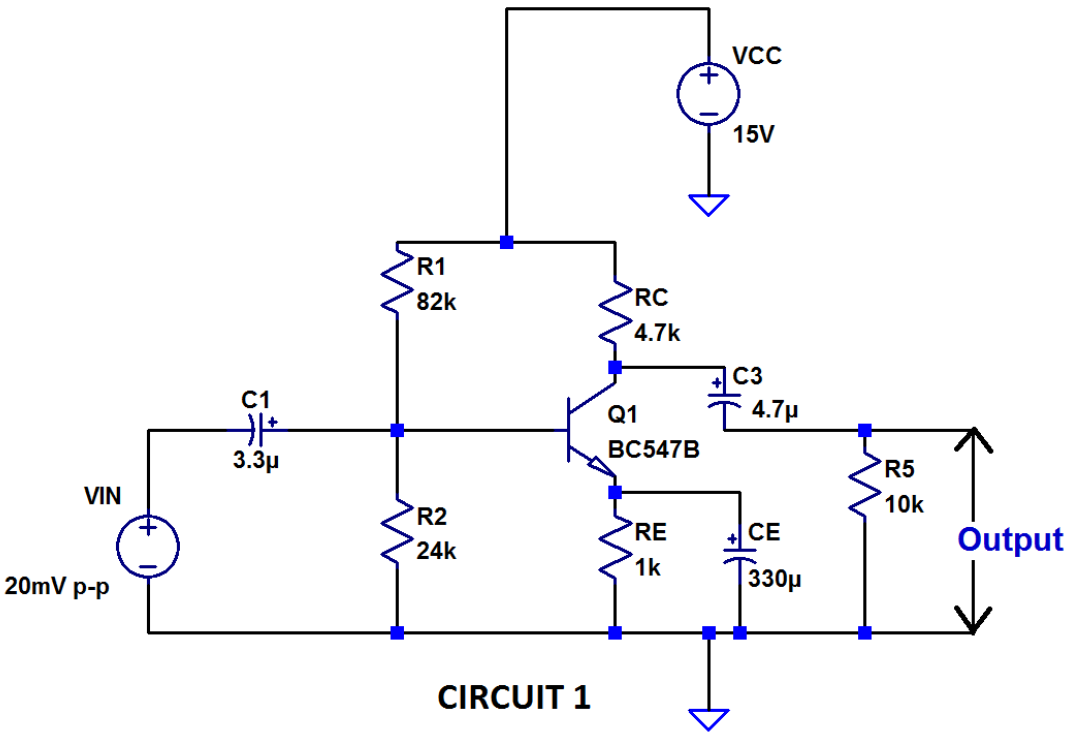
2. Explain the need of dc biasing in BJT amplifiers. **[05]**

3. What are the different biasing scheme used for npn BJT, explain voltage-divider bias technique. **[05]**

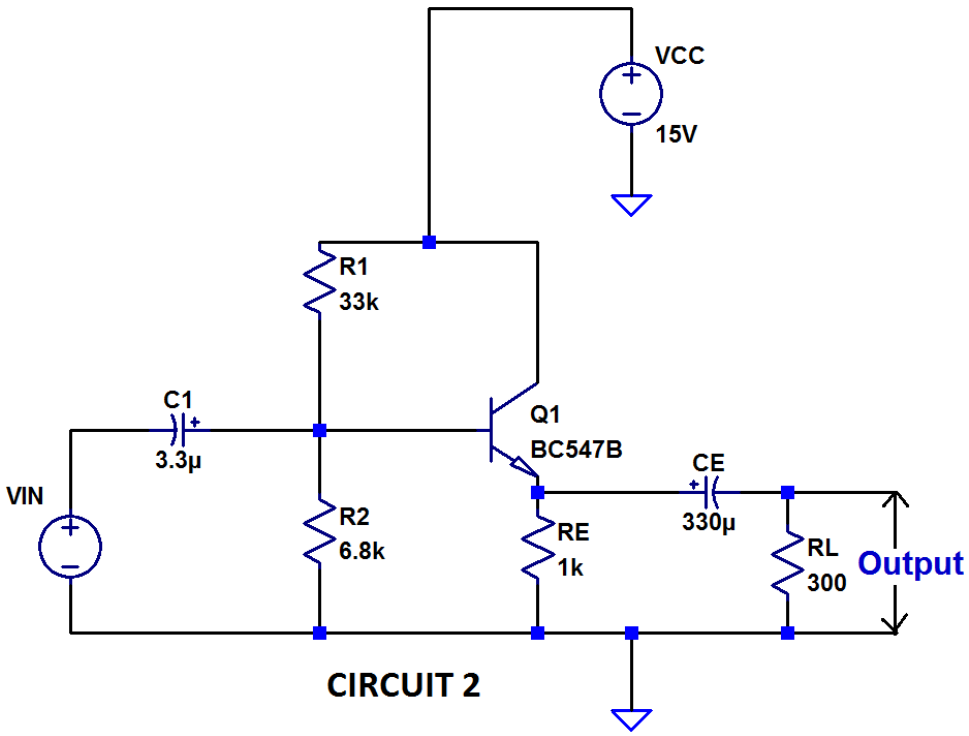
4. Draw approximate hybrid π model of CE transistor amplifier and derive the expression for A_v, Z_i and Z_o **[10]**

5. Design voltage divider biased circuit to give $I_{CQ} = 6mA, V_{CQ} = 6V$ and $\beta = 100$ **[10]**

6. Identify the amplifier configuration (Circuit 1). Find input impedance, output impdance, voltage gain and output voltage for the given circuit. Given $(\beta = 300, V_{BE} = 0.65V)$ **[10]**



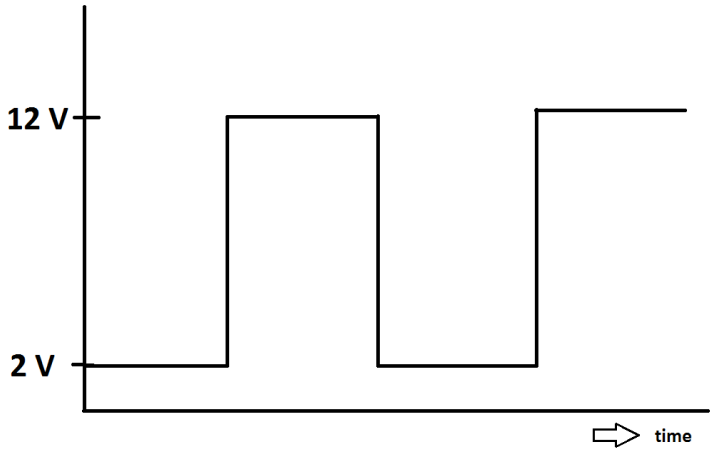
CIRCUIT 1



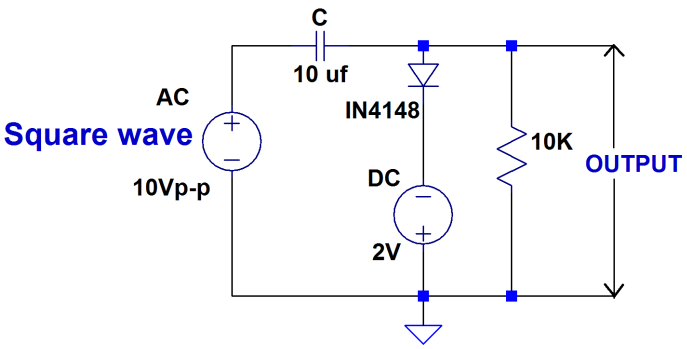
7. Identify the amplifier configuration (Circuit 2). Find input impedance, output impdance and voltage gain for the given circuit. Given ($\beta = 300, V_{BE} = 0.65V$) **[10]**

8. Compare CE, CC and CB amplifiers. **[5]**

9. Implement appropriate circuit to generate following waveform. **[5]**



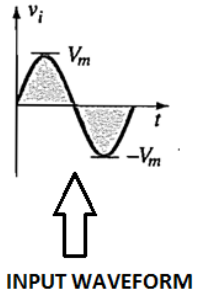
10. Identify the circuit and draw output waveform with proper voltage levels. **[5]**

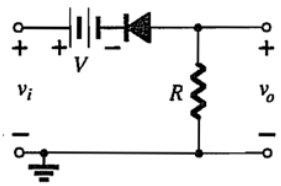


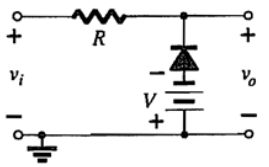
11. For the circuits given below, name the given clipper, draw Ouput waveforms, with proper justification using **[10]**

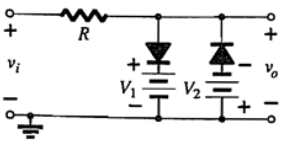
    a) Ideal diode model

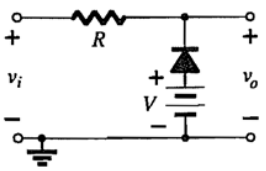
    b) Constant voltage model











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