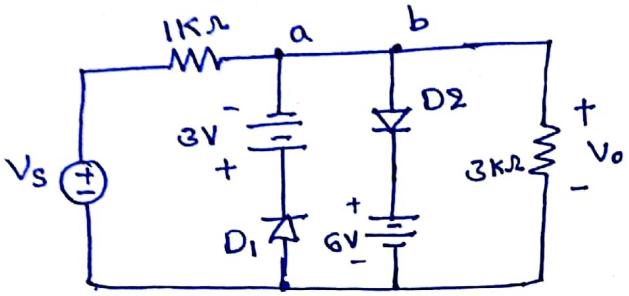
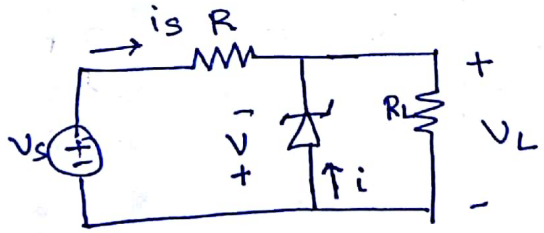
Q.1) The input voltage to the clipper circuit shown in the below figure is $V_s = 12 \sin \omega t$ V. Determine the output voltage and sketch this function.



Q.2) The zener diode in the voltage-regulator circuit shown in the below has a breakdown voltage of 9V and is to operate with a reverse current between 10 and 100mA. Given that $R = 200\Omega$,

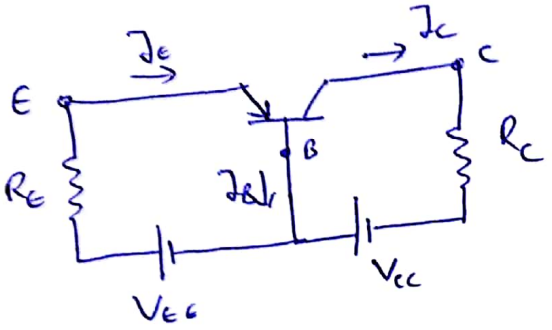
(a). Find the range of the load resistance R_L that result in a 9V load voltage when $V_s = 24$ V.

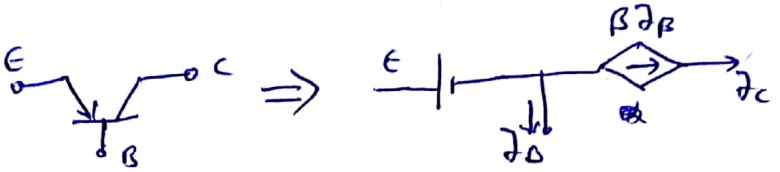
(b) Find the range of the supply voltage V_s that results in a 9V load voltage when $R_L = 600\Omega$.



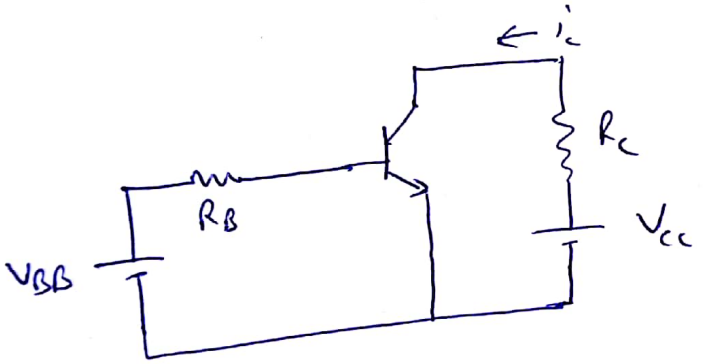
Q.3)

3). for the BJT circuit given below, suppose $V_{cc} = V_{EE} = 5V$. find R_E and R_c such that the BJT is biased in active region at $I_E = 5\ mA$, and $V_{CB} = -2V$





4) for the circuit given below, $R_B = 270\ k\Omega$, $R_c = 1.5\ k\Omega$, $V_{BB} = V_{cc} = 6V$, $\beta = 120$. (Assume active region). will the BJT continue to operate in active region, if R_c is changed to $3\ k\Omega$?



5) In the previous question (4), a resistance of $500\ \Omega$ is placed in series with emitter, find i_B, i_c, V_{CE}. (Assuming active region). Will the BJT continue to operate in active region if R_c is changed to $3\ k\Omega$