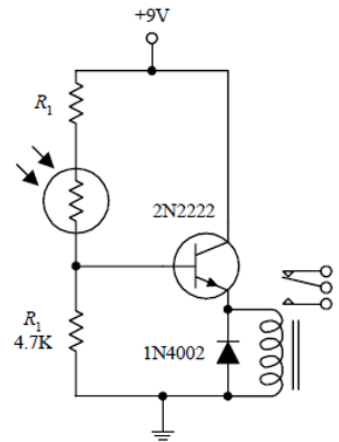
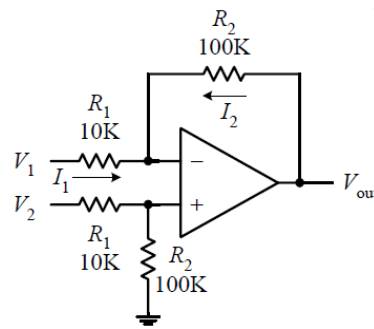


Q1/ Draw a “Light-Activated Circuit” using a photoresistor as the sensor element for light.



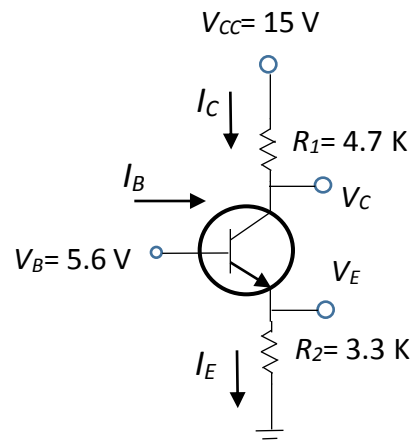
Q2/ Determine V_{out} In the following circuit.



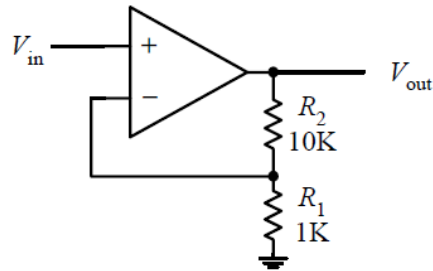
Q3/ Draw a circuit of op-amp “RC Relaxation Oscillators” and explain it briefly.

Q4/ Explain the basic components of any “Voltage Regulators” circuit.

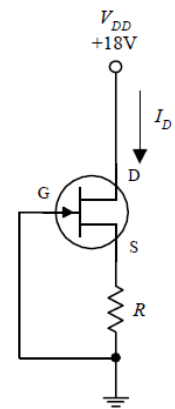
Q5/ Given $V_{CC} = +15\text{ V}$, $V_B = 5.6\text{ V}$, $R_1 = 4.7\text{ k}\Omega$,
 $R_2 = 3.3\text{ k}\Omega$, and $h_{FE} = 100$, find V_E , I_E , I_B , I_C , and V_C .



Q6/ Solve for the gain (V_{out}/V_{in}) of the circuit below, then find the value of the voltage gain.

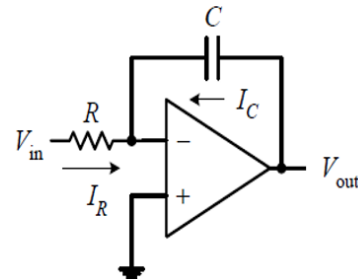


Q7/ If $V_{GS,off} = -4\text{ V}$ and $I_{DSS} = 12\text{ mA}$, find the values of I_D and g_m and R_{DS} when $V_{GS} = -2\text{ V}$ and when $V_{GS} = +1\text{ V}$. Assume that the JFET is in the active region.



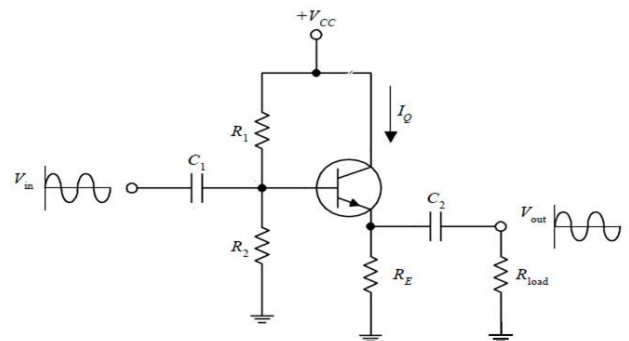
Q8/ Draw and explain “ASTABLE MULTIVIBRATOR” transistor circuit.

Q9/ Solve for V_{out} in terms of V_{in} .

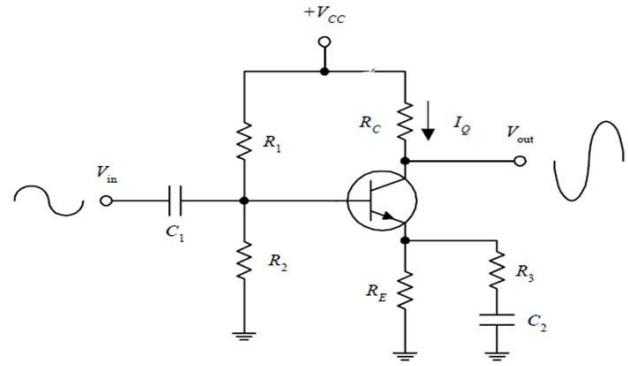


Q10/ Explain the basic configuration and function of “The 555 Timer IC”.

Q11/ For the following “EMITTER-FOLLOWER AMPLIFIER” circuit, [$R_{load} = 3\text{ k}\Omega$, $V_{CC} = +20\text{ V}$, $\beta = 100$, $f = 100\text{ Hz}$]. Find R_E , R_1 , R_2 , $R_{in}(base,dc)$, $R_{in}(base,ac)$, C_1 , C_2 .



Q12/ For the following “common-emitter amplifier” circuit, [voltage gain= -100 , an $f=100$ Hz, and a quiescent current $I_Q = 1$ mA, where $\beta= 100$ and $V_{CC} = 10$ V]. Find R_E , R_1 , R_2 , $R_{in}(\text{base,dc})$, $R_{in}(\text{base,ac})$, C_1 , C_2 .



Q13/ Write 5 notes technical about “non-original phone chargers” available in the market.

Q14/ Draw the characteristic curve of JFET transistor.

Q15/ An n -channel depletion-type MOSFET has an $I_{DDs} = 10$ mA and a $V_{GS,off} = -4$ V. Find the values of I_D , g_m , and R_{DS} when $V_{GS} = -2$ V. Assume that the MOSFET is in the active region.

