II PUC ELECTRONICS

Field effect transistor

1) A JFET has $g_m = 1500\,\mu s$ and $r_d = 5\,K\Omega$. Determine its μ

2) A n-channel JFET rated with values $I_{DSS} = 10mA$ and $V_p = -3.5V$ is operated with I_D measured to be 3.265mA. What is the value of V_{GS}?

3) The pinch off voltage of FET is -3V and drain saturation current is 40mA. If the gate to source voltage is -2V and drain to source voltage is 4V. Determine its drain current, transconductance and DC drain resistance.

2) Bipolar Junction transistor biasing

1) For the given parameter values of voltage divider biasing circuit, determine the end points of the dc load line and draw the dc load line. $R_1 = 56K\Omega$, $R_2 = 10K\Omega$, $R_C = 2.2K\Omega$, $R_E = 1K\Omega$ and $V_{CC} = 12V$.

3) Transistor Amplifiers

1) A 3 stage amplifier has a first stage voltage gain of 10, second stage voltage gain of 50 and third stage voltage gain of 400. If the input voltage given at the first stage of amplifier is 10mV. Calculate the output of each stage. Also find the total voltage gain in dB

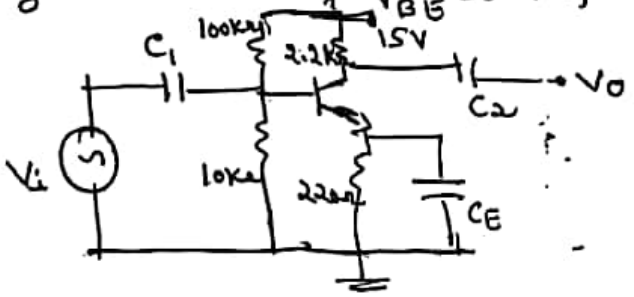
2) Find the voltage gain and input resistance of a single stage CE Amplifier. If $V_{CC} = 18V$,

$R_1 = 47k\Omega$, $R_2 = 12k\Omega$, $R_C = 3.3k\Omega$, $R_E = 1000\Omega$, $R_L = 10k\Omega$, $\beta = 100$, $V_{BE} = 0.3V$, $r_e' = 52mV/I_E$

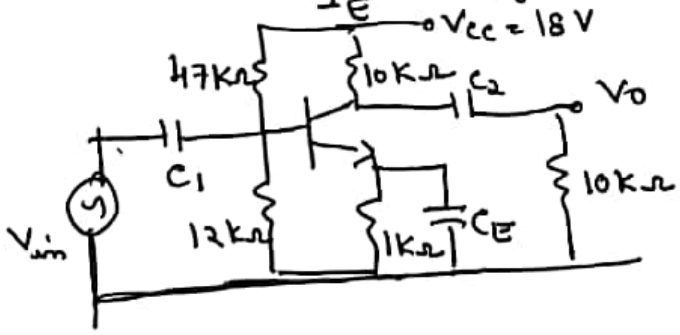
3) For the circuit given below $R_1 = 100K\Omega$, $R_2 = 10K\Omega$, $R_C = 2.2k\Omega$, $R_E = 220\Omega$, $V_{CC} = 15V$, $I_E = 3.41mA$ and $\beta = 100$, Calculate the voltage gain, r_e', power gain, A_V in dB. and A_p in dB,

4) For the CE Amplifier circuit using Silicon transistor given below, find

(i) voltage across 10kΩ (ii) I_E (iii) r_e' (iv) A_V (v) A_I. Given $\beta = 100$, $V_{BE} = 0.7V$, $r_e' = \frac{26mV}{I_E}$



5) CE Amplifier circuit using Germanium transistor is shown in figure, Calculate (i) voltage across 12kΩ (ii) I_E (iii) Z_{in} (base) (iv) A_V (v) Z_o given $r_e' = \frac{52mV}{I_E}$, $V_{BE} = 0.3V$, $\beta = 150$



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