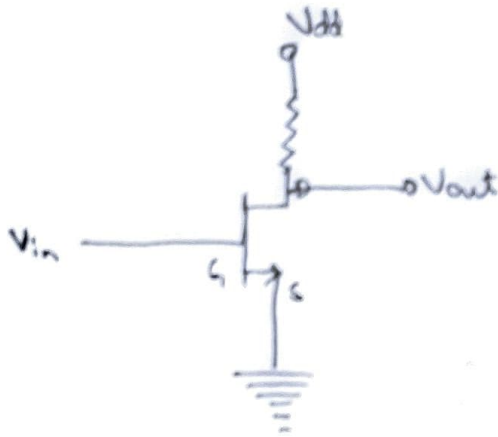


COMMON SOURCE AMPLIFIER

i) Circuit diagram



Calculation

For $A_v = 10$

we have
$$A_v^2 = \frac{2 \left(\frac{W}{L}\right)_N}{\left(\frac{W}{L}\right)_P}$$

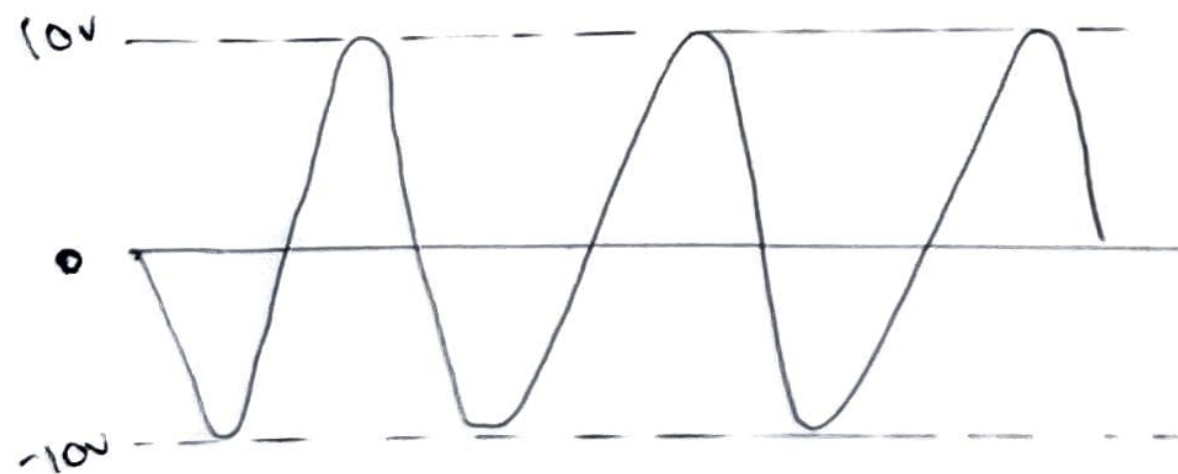
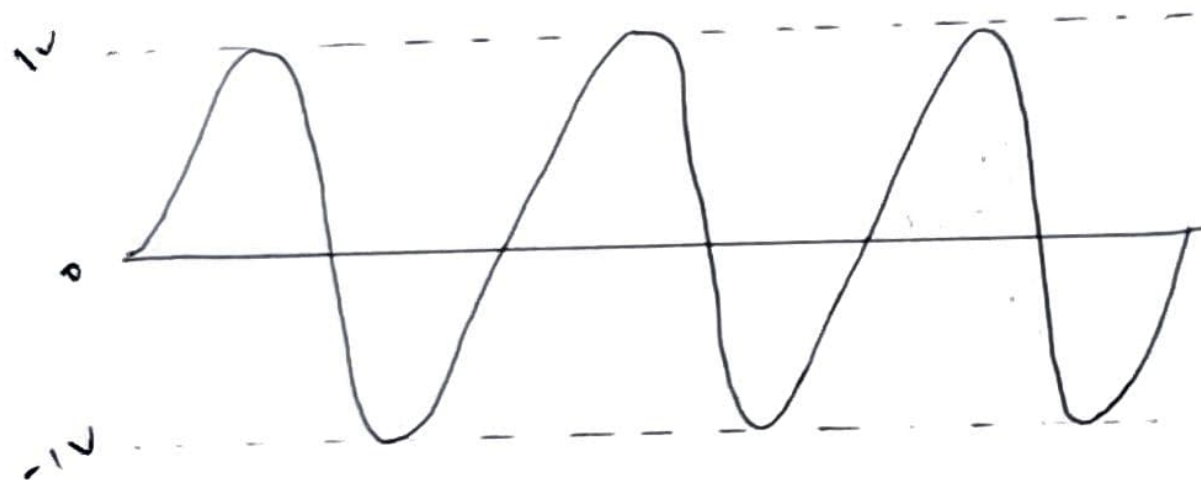
$$\frac{100}{2} = \frac{\left(\frac{W}{L}\right)_N}{\left(\frac{W}{L}\right)_P}$$

$$\left(\frac{W}{L}\right)_P = \frac{1}{50} \left(\frac{W}{L}\right)_N$$

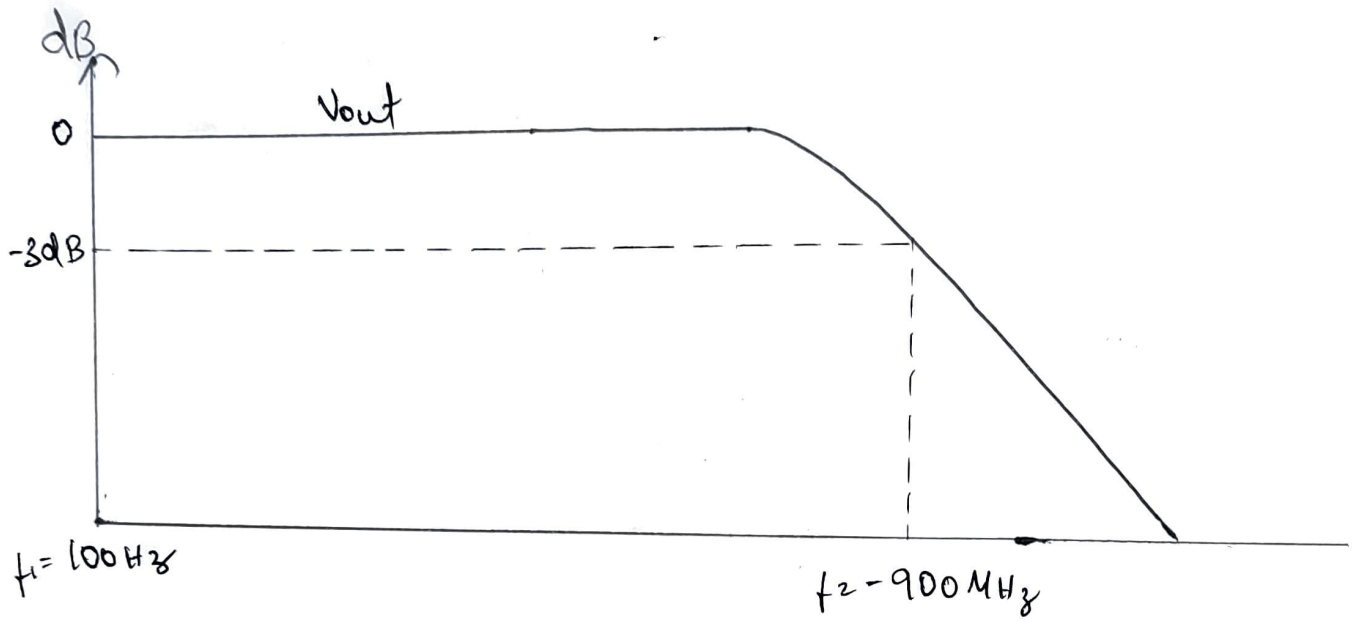
$$\therefore \left(\frac{W}{L}\right)_N = \frac{5}{1}$$

$$\left(\frac{W}{L}\right)_P = \frac{2}{20}$$

Transient Analysis

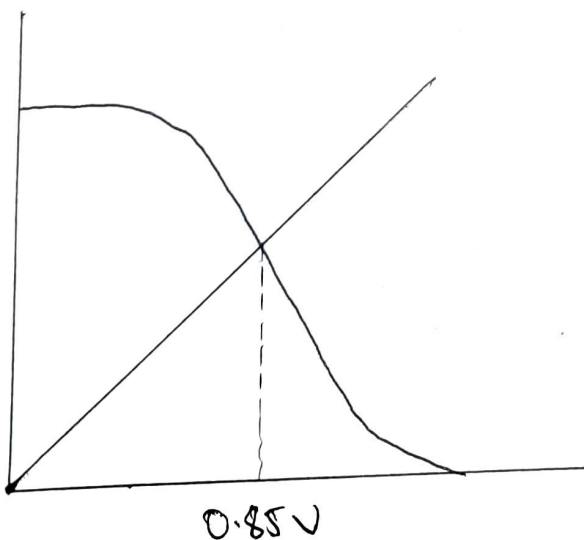


AC Analysis



$$\begin{aligned}\text{Bandwidth} &= f_2 - f_1 \\ &= 900 MHz - 100 Hz \\ &\approx 900 MHz\end{aligned}$$

DC Analysis



Bias Point = $850 mV$