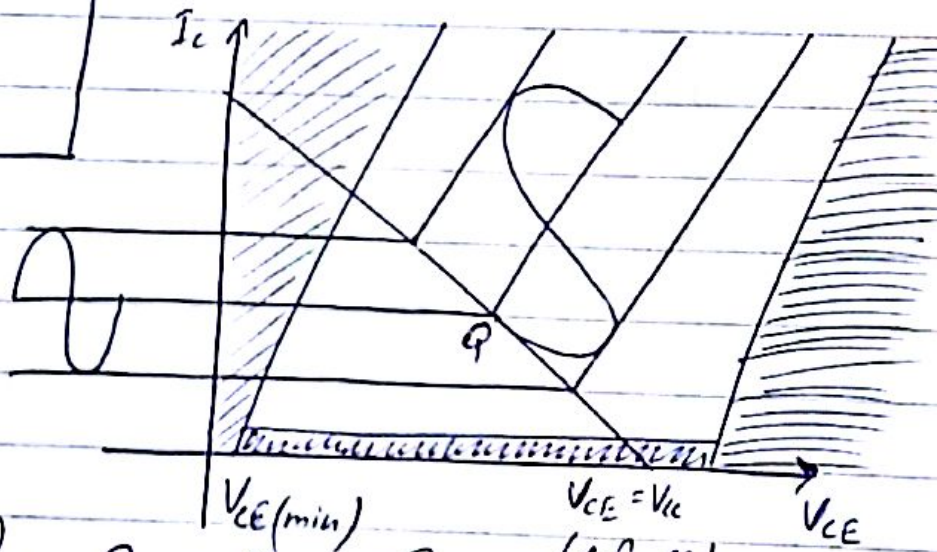
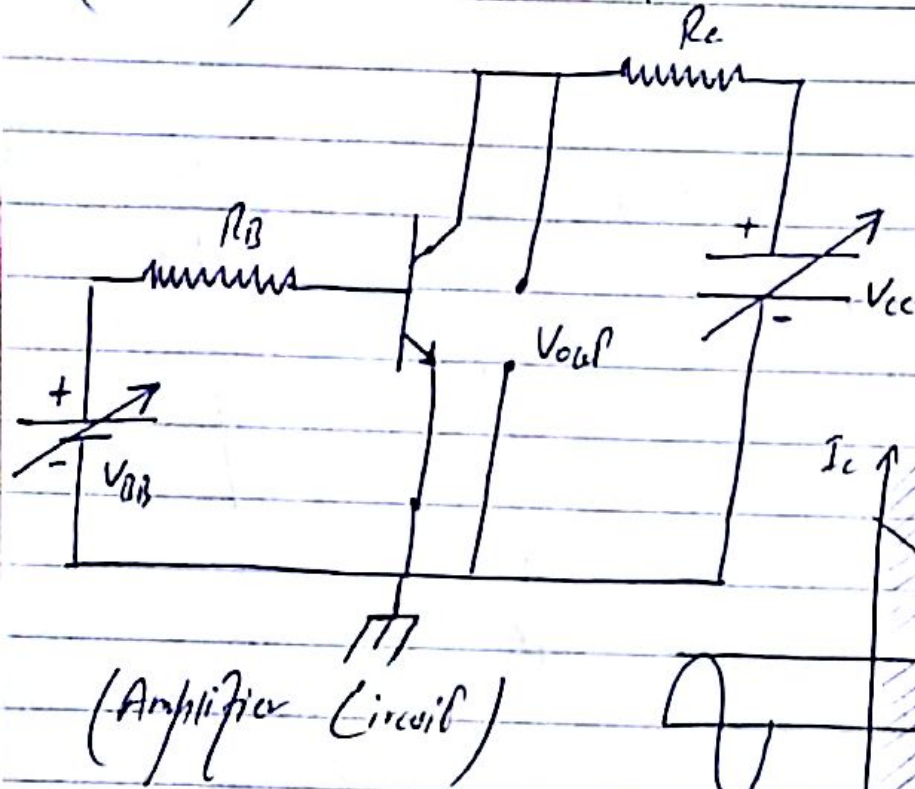


(Lecture  
20)

# Amplifier and Switches.



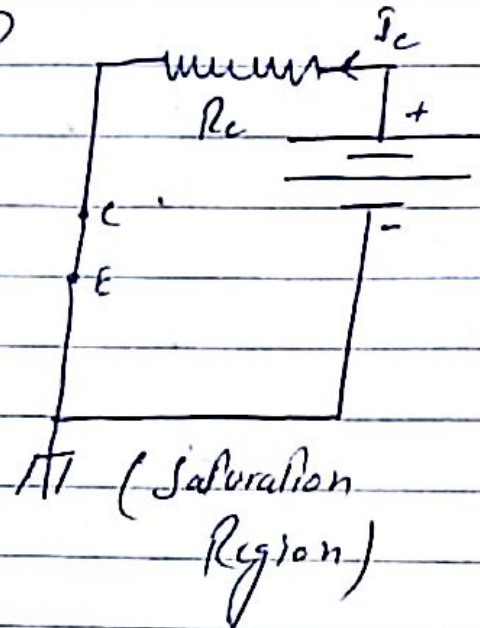
- Best operating condition for transistor is its Q point.
- Amplifier gives us phase shift.
- Amplifier works in Active region and switches always work in saturation or cut-off region.

### Switches:-

When resistance becomes zero, the circuit becomes short circuit.

- In saturation region when short circuit, switch is on because current is passing on.

$$I_c = \frac{V_c}{R_c}, \quad V_{CE} = 0$$



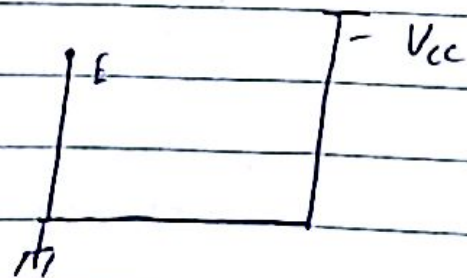
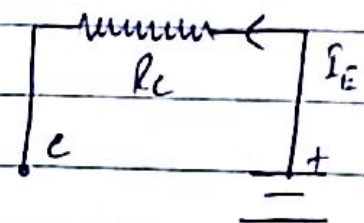
In cut-off Region:-

$$I_B = 0$$

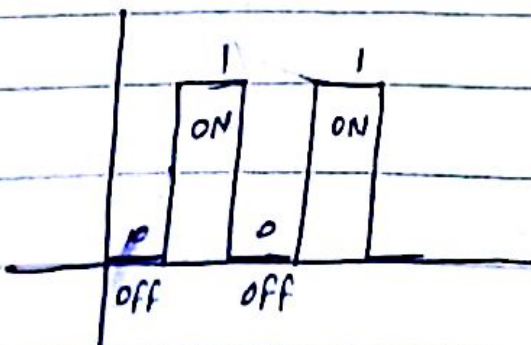
$$I_c = \beta I_B \Rightarrow I_c = 0$$

It means circuit is open

$V_{CE} = V_c$  No voltage drop



In Digital Signal:-



(when short circuit, it will be 1, when in cut-off region it will be 0.)