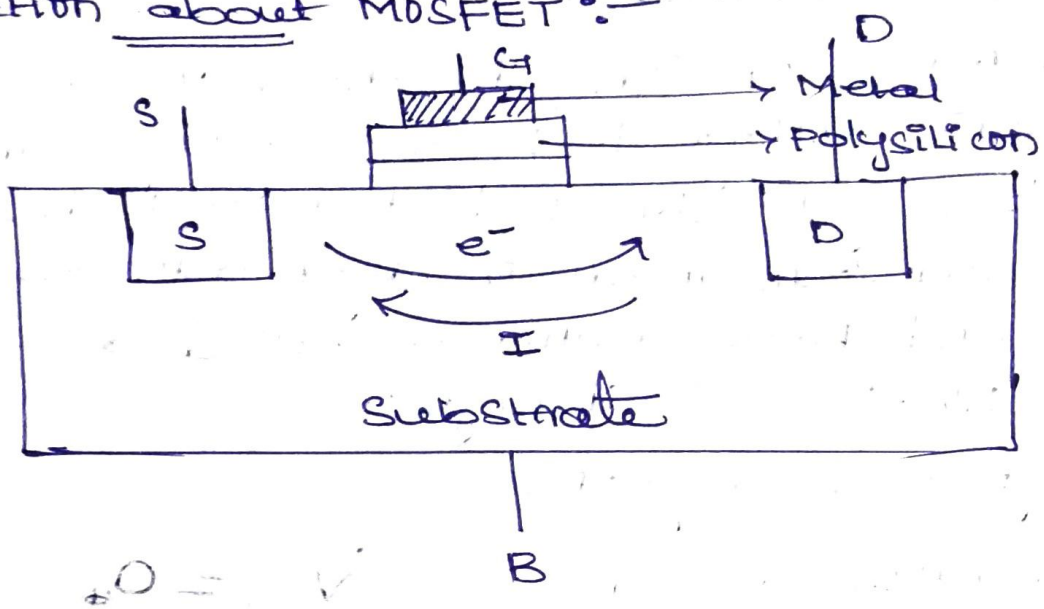
Introduction about MOSFET :-



- MOSFET is combination of four terminals such as :—
  1. Source
  2. Drain
  3. Gate
  4. Body

There are 3 types of modes,

1. Accumulation mode,
   where V_G [Gate voltage] < 0, the gate voltage is negative voltage. then, Minority charge [Holes if NMOS] carriers get attracted towards the surface, there is no flow of charge and no chance to form channel.
2. Depletion mode,
   where $V_G > 0$, the gate voltage is positive voltage, then the majority charge carriers and minority charge carriers repel each other. there is a formation of depletion region. No channel formation.

(8) Inversion mode,

where $V_G > V_{th}$ [threshold voltage], the gate voltage is positive voltage, then the e^-s get attracted towards the surface and form inversion layer between source and Drain terminal called as channel.

No flow of charge.

Types of regions,

(1) cutoff region: $[V_{GS} < 0]$, $[V_{DS} = 0]$

* NO channel formation
* NO flow of charge

(2) Linear region: $[V_{GS} > V_{th}] \neq [V_{DS} = 0]$

* channel can be formed.
* NO flow of charge

(3) Saturation region: $V_{GS} > V_{th}$

$V_{DS} \geq V_{GS} - V_{th}$

* channel can be formed.
* flow of charge is possible

(4) pinchoff region: $V_{DS} = V_{GS} - V_{th}$

The channel get decreased towards drain at some V_{DS} point, net charge = 0

channel increases towards source.

Due to electric field the e^-s are thrown from Drain to source.