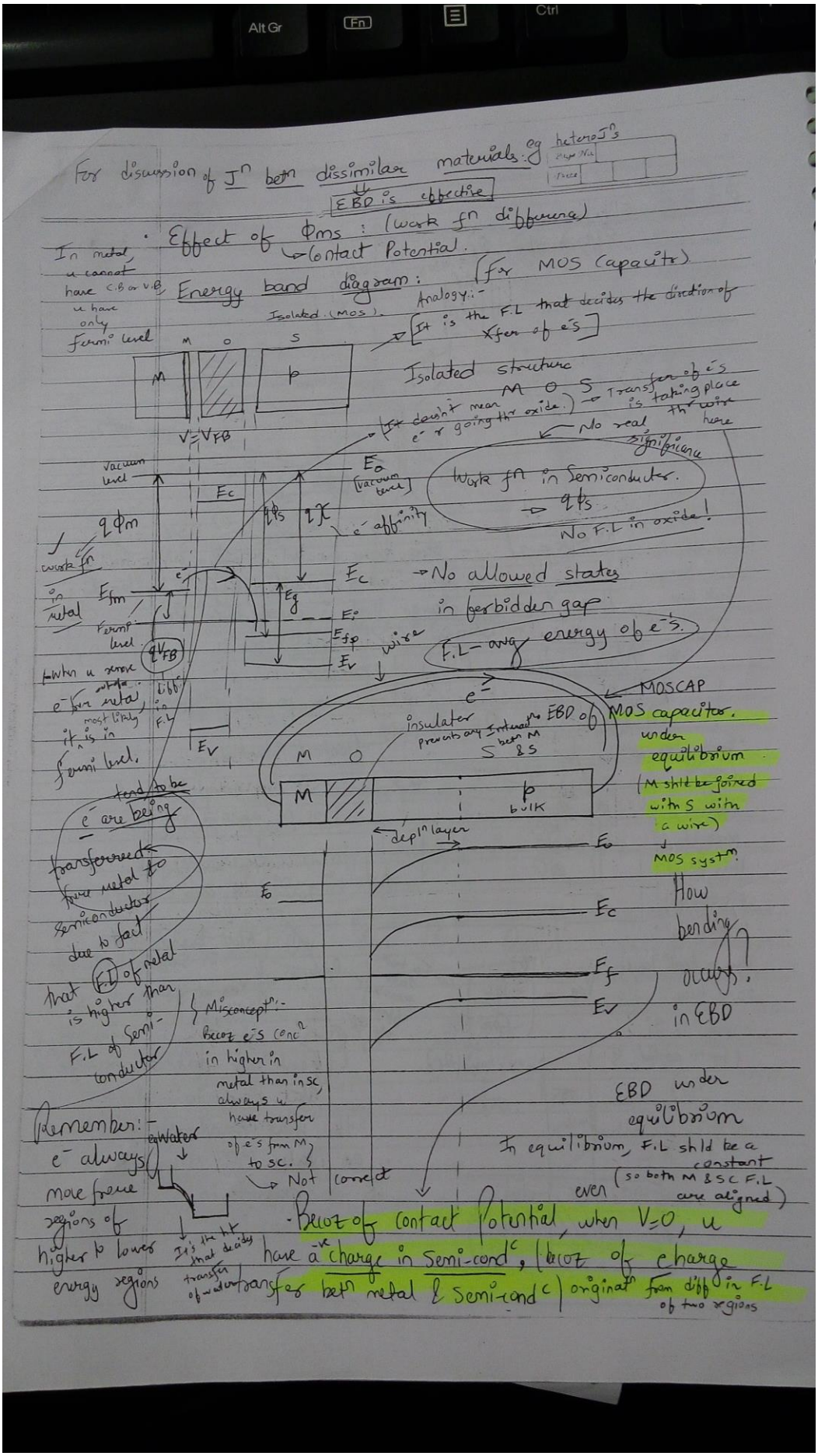
For discussion of J^n betn dissimilar materials: eg hetero J^n's
EBD is effective
In metal, u cannot have C.B or V.B u have only Fermi level
Effect of Φms : (work fn difference)
↳ Contact Potential.
Energy band diagram: (For MOS capacitor)
Isolated (MOS).
Analogy:- [It is the F.L that decides the direction of Xfer of e's]
Isolated structure
M O S
Transfer of e's is taking place thr' wire here
No real significance
Work fn in Semiconductor.
→ qΦs
No F.L in oxide!
Vacuum level
Ec
qΦm
work fn in metal
Efm
Fermi level
qVFB
e⁻ affinity
Eo [vacuum level]
Ec
Eg
Ei
Efp
Ev
→ No allowed states in forbidden gap
F.L - avg energy of e⁻s.
wire
e⁻
MOSCAP
MOS capacitor, under equilibrium (M shld be joined with S with a wire)
↓
MOS syst^m.
insulator prevents any interaction betn M & S
EBD of
M O
M
p bulk
depl^n layer
Eo
Ec
Ef
Ev
How bending occurs, in EBD
e⁻ are being transferred from metal to semiconductor due to fact that F.L of metal is higher than F.L of semi-conductor
Misconcept^n:- Becoz e⁻s conc^n in higher in metal than in sc, always u have transfer of e⁻s from M to sc.
↳ Not correct
Remember:- e⁻ always move from regions of higher to lower energy regions
e⁻water
It's the F.L that decides transfer of e⁻s
EBD under equilibrium
In equilibrium, F.L shld be a constant (so both M & SC F.L are aligned even)
Becoz of contact potential, when V=0, u have a -ve charge in Semi-cond^c, (becoz of charge transfer betn metal & Semi-cond^c) originate from diff in F.L of two regions