Started on	Monday, 11 April 2022, 3:26 PM
State	Finished
Completed on	Monday, 11 April 2022, 4:00 PM
Time taken	33 mins 21 secs
Grade	**8.00** out of 20.00 (**40**%)

Question **1**

Correct

Mark 2.00 out of 2.00

If the doping levels of an abrupt Si diode are
N_d=10^17/cm3
N_a=10^15/cm3.
Calculate the diffusion potential at room temperature!

Answer: 0.7184 ✔

V

Question **2**

Partially correct

Mark 2.00 out of 4.00

If the doping levels of an abrupt Si diode are
N_d=10^18/cm3
N_a=10^16/cm3
and
eps_r=11.8
eps_0=8.85419e-12 F/m
U=0
Calculate the width of the depletion layers on the less doped side (**um**)!

Answer: 0.003 ✖

Comment:
Conversion error.

Question **3**

Correct

Mark 4.00 out of 4.00

Calculate the saturation current (**mA**) of a p channel enhancement MOSFET if
-gate-source voltage is -1.2 V
-threshold voltage is -0.3 V
-channel width 0.5 µm
-channel length 0.35 µm!
-electron mobility 500 cm^2/(V*s)
-oxide relative permittivity 3.84
-vacuum permittivity 8.85419E-12 F/m
-oxide thickness 15 nm
Assume that the MOSFET is in saturation!

Answer: 0.07405 ✔

mA

Question **4**

Complete

Mark 0.00 out of 10.00

Describe the breakdown phenomena of the diode (**explanation,** cross-section view, characteristic figures and equations)!

a breakdown phenomena of a diode happens when we apply a negative value across the diode. the diode will try to prevent the inverse current (there will still be some small negative current at this point) for a certain amount of negative voltage until one point which the breakdown happened and a reverse current will just flow back based on the characteristic.

Due to the flow of reverse current the width of the junction barrier increases. When this applied reverse bias voltage is increased graduall

Comment:
Wrong description.

◄ Midterm - test questions

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