ECE 340: Quiz

Name:_____

The table below is the portion of the periodic table of elements for semiconductor materials:

II	III	IV	V	VI
	B	C	N	
	Al	Si	P	S
Zn	Ga	Ge	As	Se
Cd	In		Sb	Te

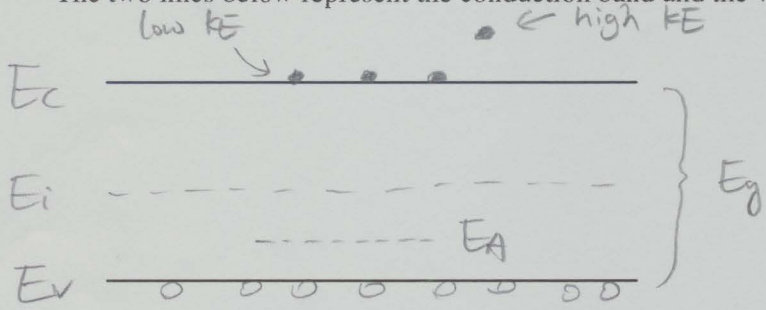
Consider a silicon sample that is doped with gallium (Ga):

1) Is the material n or p-type? (1 point) p-type

2) Justify your answer (1 points)

Ga atom has one less electron than Si

The two lines below represent the conduction band and the valence band of a Si semiconductor:



3) Label the conduction band (E_C) and the valence band (E_V) (1 point).

Indicate <u>schematically</u> the following:

4) The position of the intrinsic level (E_i), the position of the gallium level (E_D, if it is a donor; E_A, if it is an acceptor). (2 points)

5) The energy gap. (1 point)

6) The electrons by solid dots ●, and the holes by open dots ○. (2 points)

7) An electron with high kinetic energy and an electron with low kinetic energy. (1 point)

8) Are there more electrons or holes? Why? (1 points)

more holes. p-doped with Ga.