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Week 10 Quiz ANSWERS: MS Diodes
ECE 305: Semiconductor Devices
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Answer the **multiple choice questions** below by choosing the **one, best answer**.

- 1) For a metal-semiconductor diode, which of the following is true?
 - a) The saturation current density is much larger than for a PN junction with the same bandgap semiconductor.
 - b) The the $n = 2$ current is absent.
 - c) The diode turn-on voltage is reduced as compared to a PN junction with the same bandgap semiconductor.
 - d) All of the above.**
 - e) None of the above.

- 2) To make an ohmic contact to an n-type semiconductor, one could:
 - a) Select a metal with a workfunction smaller than that of the semiconductor.**
 - b) Select a metal with a workfunction larger than that of the semiconductor.
 - c) Use a lightly doped semiconductor.
 - d) Insert a thin insulating layer under the metal.
 - e) Reduce the minority carrier lifetime in the semiconductor.

- 3) For an ideal metal-n-type GaAs diode, which type of carrier transport dominates under reverse bias?
 - a) Electron injection from the metal to semiconductor.**
 - b) Electron injection from the semiconductor to metal.
 - c) Hole injection from the metal to semiconductor.
 - d) Hole injection from the semiconductor to metal.
 - e) Electron-hole recombination in the semiconductor.

- 4) The electrostatics of the MS diode in question 3) are similar to which of the following?
 - a) A p⁺/n junction.**
 - b) A p/n junction.
 - c) An n⁺/p junction.
 - d) An n/p junction
 - e) None of the above.

- 5) For an ideal metal-p-type GaAs diode, which type of carrier transport dominates under forward bias?
 - a) Electron injection from the metal to semiconductor.
 - b) Electron injection from the semiconductor to metal.
 - c) Hole injection from the metal to semiconductor.
 - d) Hole injection from the semiconductor to metal.**
 - e) Electron-hole recombination in the semiconductor