EE 5621 QUIZ 4 27 October 2021

**PROBLEM 1** (37 Points, Parts (a), (b), (c) 9 Points each, Part (d) 10 Points) Metallization S. G. Burns



1. Sketch the energy band structure and the resultant I-V curve for an n+-p+  and qualitatively explain why this could be considered an “ohmic” contact.

**Problem 2** (63 Points) Deposition Pot-Pourri

1. 1 Atmosphere, like you would hear on a weather forecast corresponds to about \_\_\_\_\_\_bar, \_\_\_\_\_torr , \_\_\_\_\_\_inches of Hg.

Select from one of the following to answer the Parts (b) through ( ) **EVAPORATION, SPUTTERING, CVD, MBE.**

(b)\_\_\_\_\_\_\_\_\_\_\_\_Good step coverage is a problem.

(c) \_\_\_\_\_\_\_\_\_\_\_\_Good for III-V heterostructures.

(d) \_\_\_\_\_\_\_\_\_\_\_\_Usually used for growing thick layers of Polycrystalline Si.

(e) \_\_\_\_\_\_\_\_\_\_\_\_Very flexible; can deposit semiconductors, metals, and dielectrics

(f) \_\_\_\_\_\_\_\_\_\_\_\_ W (tungsten) deposition on the interior of an incandescent light bulb

(g) \_\_\_\_\_\_\_\_\_\_\_\_Requires a high DC potential for depositing metals on the substrate (anode)

(h)\_\_\_\_\_\_\_\_\_\_\_\_Requires a RF generator, could be a magnetron, to deposit dielectrics such as SiO2 or Al2O3

(i)\_\_\_\_\_\_\_\_\_\_\_\_\_Best for depositing monolayers of III-V materials

1. At 200C, compute the best case for the sheet resistance of a 1 m thick line.
2. Repeat it T= 450C after annealing.
3. Compute the contact resistance for Parts (a) and (b) for a 1.5 m x 1.5 m via through SiO2.