1. An intrinsic semiconductor material M has a bandgap of 2 eV and its valence band edge is located at -6 eV /vacuum. Find the conduction band edge energy level, Fermi level and draw the band diagram. I would like to make this intrinsic semiconductor in to n-type and label the material as n-M. With appropriate equation(s) give the possible generic ways by which this semiconductor shall be made in to n-type. Make a junction between the intrinsic and n-type semiconductor and draw the band diagram.
2. Yesterday my good friend accidently dropped a rubber band in cryogenic liquid nitrogen. He is an IIT-M alumnus, hence he cannot let anything go just like that. So he took that rubber band and immediately did stress-strain measurements. Then he let the frozen rubber band to heat to room temperature and did a similar measurement again. Can you guess what kind of stress-strain profiles he might have obtained at cryogenic liquid nitrogen and room temperatures. Take glass transition of rubber band as -70 deg C.