Assignment on EEE-317, Session: 2021-2022

In materials science and solid-state engineering, pure or perfect crystals are tremendously boring and often functionally useless. Thus, real-world engineering depends heavily on imperfections to manipulate how a material behaves mechanically, electrically, optically, and chemically. Additionally, crystal defects such as vacancies, dislocations, and impurities affect charge transport and carrier recombination in semiconductors, and evaluate their impact on the performance of electronic devices such as diodes, transistors, and solar cells etc. Thus, write an assignment on **"Effects of Crystal Defects on Electrical Conductivity and Carrier Lifetime in Semiconductor Materials".**

You should focus on connecting crystal structure, band theory, carrier transport, recombination mechanisms, and device performance. Provide clear explanations and calculations, where applicable, to support your answers. Include any relevant diagrams, graphs, or illustrations to enhance your explanations. Ensure that your document is well-organized, structured, and free from grammatical errors.