In this work, CuxOy and ZnO:Al thin films on plain glass substrates have been deposited as single thin films for property characterization by reactive DC Magnetron Sputtering and evaporation techniques using an Edward Auto 306 Magnetron Sputtering System respectively. A CuxOy-ZnO:Al p-n junction was fabricated by reactive DC magnetron sputtering and reactive thermal evaporation technique on a glass slide with silver as contacts. Transmittance and reflectance data in the range 300 nm-2500 nm were obtained using UV-VIS NIR Spectrophotometer Solid State 3700 DUV for all the thin films samples that were prepared. Transmittance values of above 70% for Copper Oxide and above 80 % for AZO were observed. The optical measurements were simulated using SCOUT 98 software to determine optical constants and optical bad gap of the thin films. Band gap values of 1.62 eV – 2.54 eV are observed for Copper Oxide and 3.18 eV - 3.42 eV for AZO. The surface sheet resistivities at room temperature of 298 K were found to vary with the deposition parameters and film thickness. Urbach energy for AZO was found to increase with doping levels from 2.08 × 10-4 to 2.18× 10-4 and varied between 0.6 ×10-4