In this work the capabilities of a high-order Discontinuous Galerkin (DG) method applied to the computation of turbomachinery flows are investigated. The Reynolds averaged Navier–Stokes equations coupled with the two equations k-ω turbulence model are solved to predict the flow features, either in a fixed or rotating reference frame, to simulate the fluid flow around bodies that operate under an imposed steady rotation. To ensure, by design, the positivity of all thermodynamic variables at a discrete level, a set of primitive variables based on pressure and temperature logarithms is used. The flow fields through the MTU T106A low-pressure turbine cascade and the NASA Rotor 37 axial compressor have been computed up to fourth-order of accuracy and compared to the experimental and numerical data available in the literature.