We investigate the linear theory of Kelvin-Helmholtz instability in partially ionized dusty plasma consisting of positive ions, electrons, dust grains and neutral gas molecules. The neutral gas is taken to be at rest. The dust grains are so heavy that they do not participate in plasma motion and therefore we do not consider the collisions of dust grains with neutral gas molecules. The equilibrium electric field $E_o$ is taken along the $z$-axis. The density distribution of the unperturbed state of ion is taken to be of the type $n_{+o}(x) = n_{+o} e^{\lambda x}$ with $n_{+o} = \text{constants}$. The ions flow along the magnetic field $B$. We derive a dispersion relation and solve it numerically to study K-H unstable modes. The variation of growth rate as a function of various parameters has been shown graphically. It is observed that growth rate increases with $\varepsilon Z$ and flow parameter, while the growth rate decreases with the increase in collisional frequency ratio parameter. The results of our problem might be useful in astrophysical plasmas such as galactic radio jets, dusty plasma environment of noctilucent clouds, cometary environments and superwinds of primeval galaxies in the intergalactic medium, and laboratory plasmas.