Deformed by tidal forces and rotational effects, the cavity of a planetary fluid core where dynamo action takes place, is usually in the shape of non-spherical geometry. Gravitational interaction between a planet and its parent star or moon exerts a torque on the planet and forces its longitudinal and latitudinal libration. Both longitudinal and latitudinal libration drive fluid motion in non-spherical planetary cores via viscous and topographic coupling between the planetary mantle and fluid core. We shall present an asymptotic theory describing the fluid motion in non-spherical planetary cores driven by longitudinal and latitudinal libration. We shall also present the result of direct three-dimensional numerical simulation of the same problem using an EBE (Element-By-Element) finite element method. Implications of the result for planetary dynamos will be discussed.