3. Comets move around the Sun in highly elliptical orbits. The gravitational force on the comet due to the Sun is not normal to the comet's velocity in general. Yet the work done by the gravitational force over every complete orbit of the comet is zero. Why?

Sol. The gravitational force is a conservative force, hence, work done by the gravitational force over one complete (closed) orbit of the comet is zero. Gravitational force is conservative in nature. The work done by a conservative force in a closed cycle is zero. Hence, work done by the gravitational attraction of the sun is zero.