

Problem 1.2

State whether each of the following systems is closed or open and whether it is isolated or nonisolated: (a) a system enclosed in rigid, impermeable, thermally conducting walls; (b) a human being; (c) the planet earth.

Solution

- (a) The system is closed because of the impermeable walls (mass can neither enter nor leave the system), and it is nonisolated because the walls are thermally conducting (energy can be exchanged with the surroundings).
- (b) The system is open (matter, such as food and air, can enter through the mouth and nose), and it is nonisolated (skin is thermally conducting).
- (c) The system is open (meteorites strike the Earth), and it is nonisolated (energy is absorbed from the sun).