

A sphere, a cube and a thin circular plate, all of same material and same mass are initially heated to same high temperature.

- (a) Plate will cool fastest and cube the slowest
- (b) Sphere will cool fastest and cube the slowest
- (c) Plate will cool fastest and sphere the slowest
- (d) Cube will cool fastest and plate the slowest.

The rate of loss of heat i.e. $(-\frac{dQ}{dt})$ is directly proportional to the temperature difference between body and surrounding, surface area exposed to surrounding, material of object.

Also, for a given body of given mass and material, surface area is minimum for a sphere.

⇒ Sphere will lose the heat with maximum rate
⇒ It will cool fastest (option (c) only).