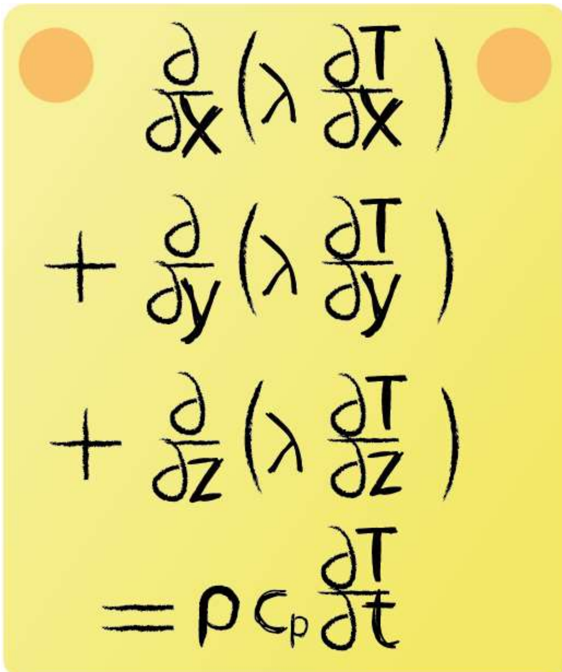
Lecture 14 - Question 1



Consider a medium in which the heat conduction equation is given in its simplest form as:

$$\frac{\partial}{\partial x}\left(\lambda\frac{\partial T}{\partial x}\right)+\frac{\partial}{\partial y}\left(\lambda\frac{\partial T}{\partial y}\right)+\frac{\partial}{\partial z}\left(\lambda\frac{\partial T}{\partial z}\right)=\rho c_p\frac{\partial T}{\partial t}$$

Indicate whether:
The heat transfer is **steady** / **transient**.
The heat transfer is **one-**/ **two-**/ **three-**dimensional.
There is **heat generation** / **no heat generation** in the medium.

From the equation it can be seen that the heat transfer is **transient**, as $\frac{\partial}{\partial t} \neq 0$.
The heat transfer is **three**-dimensional as there are three partial derivatives with respect to x, y and z
No $\dot{\Phi}'''$ is given. Implying that **no heat generation** takes place.