



UNIT – III APPLICATION OF PARTIAL DIFFERENTIAL EQUATIONS

TUTORIAL 2

1. A tightly stretched flexible string has its ends fixed at $x=0$ and $x=l$. At time $t=0$, the string is given a shape defined by $f(x) = kx^2(l-x)$, where k is a constant and then released from rest. Find the displacement of any point x of the string at any time $t>0$.
2. A taut string of length ' l ' is fastened at both ends. The midpoint of the string is taken to a height of ' b ' and then released from rest in its equilibrium position. Find the displacement function $Y(x, t)$
3. A tightly stretched string with fixed ends points $x=0$ & $x=l$ is initially at rest in its equilibrium position, if it is set vibrating by giving each point a velocity $kx(l-x)$, find the displacement function $y(x, t)$.
4. A string of length 20 is fixed at both ends is displaced from its position of equilibrium, it's initial velocity is $V = \begin{cases} x & , 0 < x < 10 \\ 20 - x & , 10 < x < 20 \end{cases}$ x is the distance from one end. Find $y(x, t)$.