Q.1: Solve the wave equation $a^2 \frac{\partial^2 u}{\partial x^2} = \frac{\partial^2 u}{\partial t^2}$ subject to the conditions $u(0, t) = 0$, $u(\pi, t) = 0$ and $u(x, 0) = 0$, $u_t(x, 0) = \sin(2x)$. 
