**Advection Diffusion with temporal variable coefficient**

Subjected to

c(x,t)=c0 @ x>=x0 and t=0

c(x,t)=0 @ x=x0 and t>0 (Dirichlet BC at left)

Lets assume u=u0f(t) and D=D0f(t)

Transform X=x-x0

Transform the equation (1) recasts

If we use

The eqn. (2) could be written:

C(Y,T)=0 @ Y>=0 and T=0

C(Y,T)=1 @ T>=0 and Y=0

The solution of eqn.(3) is the follows:

T>=0

F(Y,T),G(Y,T), and H(Y,T) are as follows: