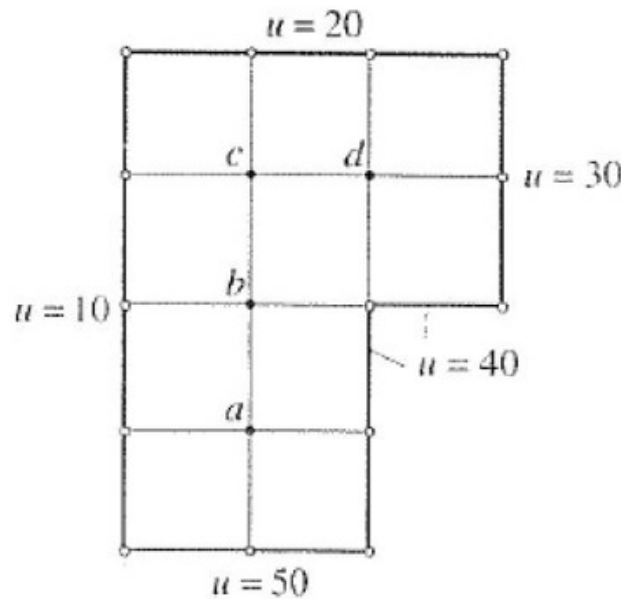


Answer all the questions.

- 1) The amount of salt  $A(t)$  present in a chemical reaction is governed by the equation (15)  

$$\frac{dA}{dt} + tA = 0$$
 with  $A(0)=1$ . Evaluate  $A(t)$  for  $t=0.0$  to  $0.2$  in steps of  $0.1$  using Taylor series method. Compare the solution with the exact solution. (15 Marks)
- 2) The acceleration of a moving object is described by the boundary value problem(BVP) (15)  

$$\frac{d^2y}{dt^2} = \frac{2}{1+t} y^2$$
 subject to  $y(0)=1$  and  $y(1)=0.5$ . Assuming that  $h=0.25$ , obtain the finite difference analogue of the BVP and write the equations to get the values of displacement  $y(t)$  at different nodal points. (15 Marks)
- 3) Solve  $\nabla^2 u = 0$ , which represents the steady state temperature distribution, on the domain (20)  
 shown in Figure 1. The boundaries are maintained at different temperature as shown in Figure. Find the temperature at the four indicated interior nodes . (20 Marks)



-----End-----