

Problem 9 of problem set 7

$h=0.1$

Boundary conditions $\rightarrow T_a=5$, $x=L=2$

2-nd order Backward Difference

Output –

$$T(1) = 4.662986$$

$$T(2) = 4.330491$$

$$T(3) = 4.000305$$

$$T(4) = 3.670994$$

$$T(5) = 3.341757$$

$$T(6) = 3.012344$$

$$T(7) = 2.683010$$

$$T(8) = 2.354494$$

$$T(9) = 2.028027$$

$$T(10) = 1.705346$$

$$T(11) = 1.388737$$

$$T(12) = 1.081078$$

$$T(13) = 0.785910$$

$$T(14) = 0.507511$$

$$T(15) = 0.250995$$

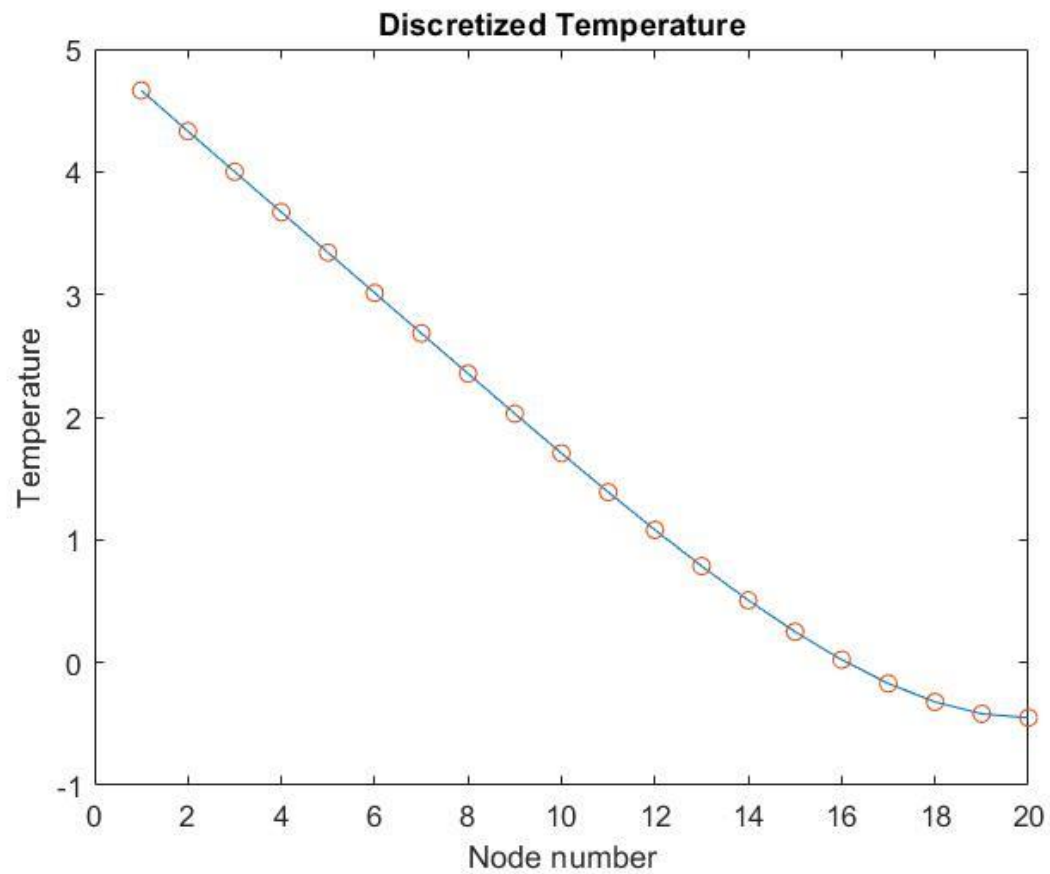
$$T(16) = 0.022421$$

$$T(17) = -0.171076$$

$$T(18) = -0.321134$$

$$T(19) = -0.417988$$

$$T(20) = -0.450272$$



2-nd order Central Difference with Ghost Node

Output –

$T(1) = 4.662873$

$T(2) = 4.330228$

$T(3) = 3.999846$

$T(4) = 3.670282$

$T(5) = 3.340722$

$T(6) = 3.010900$

$T(7) = 2.681054$

$T(8) = 2.351902$

$T(9) = 2.024647$

$T(10) = 1.700999$

$T(11) = 1.383207$

$T(12) = 1.074110$

$T(13) = 0.777200$

$T(14) = 0.496700$

$T(15) = 0.237659$

$T(16) = 0.006061$

$T(17) = -0.191048$

$T(18) = -0.345405$

$T(19) = -0.447365$

$T(20) = -0.485699$

