Math 513-131 Quiz 5 (A)

Name:.....Sec#:.....ID#:.....Ser#:.....

Q.1: Find steady–state temperature in the circular cylinder of radius 2 and height 4 by solving

$\frac{\partial^2 u}{\partial r^2} + \frac{1}{r}\frac{\partial u}{\partial r} + \frac{\partial^2 u}{\partial z^2} = 0$ with $u(2, z) = 0$, $u(r, 0) = 5$, and $u(r, 4) = 0$.

Q.2: Find steady–state temperature in the sphere of radius 2

$$\frac{\partial^2 u}{\partial r^2} + \frac{2}{r}\frac{\partial u}{\partial r} + \frac{1}{r^2}\frac{\partial^2 u}{\partial \theta^2} + \frac{\cot\theta}{r^2}\frac{\partial u}{\partial \theta} = 0,\ 0 < r < 2,\ 0 < \theta < \pi, \text{ and } u(2,\theta) = 1 + \cos\theta.$$