In this talk, we establish existence of multiple positive radial solutions of the equation

$$-\Delta u = \lambda g(|x|)f(u), \quad R_1 < |x| < R_2,$$

$x \in \mathbb{R}^N$, $N \geq 2$ subject to the following mixed boundary condition at $R_1$ and $R_2$:

\[
\begin{align*}
  u &= 0 \text{ on } |x| = R_1 \text{ and } |x| = R_2, \\
  u &= 0 \text{ on } |x| = R_1 \text{ and } \frac{\partial u}{\partial r} = 0 \text{ on } |x| = R_2, \\
  \frac{\partial u}{\partial r} &= 0 \text{ on } |x| = R_1 \text{ and } u = 0 \text{ on } |x| = R_2.
\end{align*}
\]

(1)

We use Leggett-Williams multiple fixed point theorems to obtain sufficient conditions for the existence of at least one or two positive radial solutions. (Received September 25, 2018)