

CHAPTER 1

INTRODUCTION

Baxley and Haywood [1] provided N conditions on the nonlinear function $f(y)$ by using a shooting method which guarantees that the boundary value problem (BVP) in the form

$$y''(x) + f(y) = 0, \quad 0 \leq x \leq 1, \quad (1.1)$$

$$y(0) = 0, \quad y(1) = 0, \quad (1.2)$$

has at least N nonnegative symmetric solutions.

The main purpose of this work is to provide N conditions on the nonlinear function $f(x, y)$ by using the shooting method which guarantees that the BVP

$$y''(x) + f(x, y) = 0, \quad a \leq x \leq b, \quad (1.3)$$

$$y(a) = 0, \quad y(b) = 0, \quad (1.4)$$

has at least N nonnegative symmetric solutions, where $f(x, y) \geq 0$ and $f(x, y)$ is nonlinear continuous for $x, y \in \mathbb{R}$.