(1) $y'' + \lambda y = 0,\ y(0) = 0,\ y(\ell) = 0$ (10%)

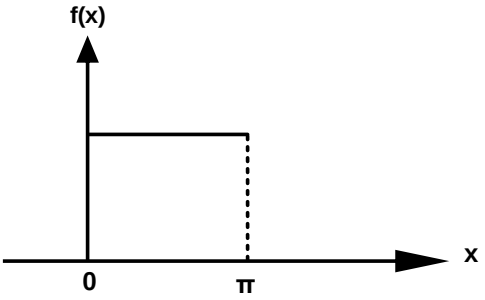
(2) $y'' + 2y' + \lambda y = 0,\ y(0) = 0,\ y(\ell) = 0$ (10%)

(3) $y'' + \lambda y = 0,\ y(0) = 0,\ y'(1) - 2y(1) = 0$ (10%)

(4) $x^2y'' + xy' + \lambda y = 0,\ y(1) = 0,\ y(\ell) = 0$ (10%)

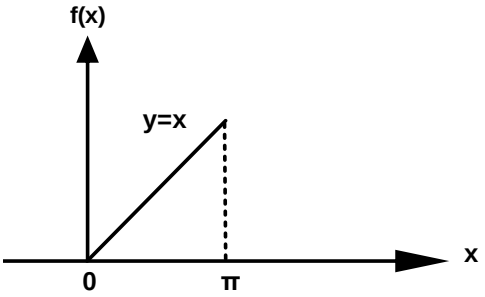
(5) $y'' + \lambda y = 0,\ y'(0) = 0,\ y'(\ell) = 0$ (10%)

(6)



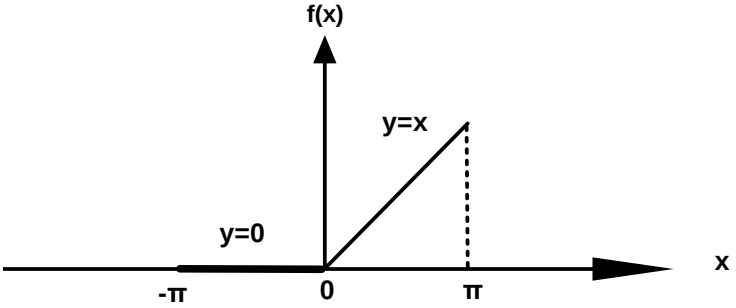
$0 \le x \le \pi$, Expand f(x) by Fourier sine series (15%)

(7)



$0 \le x \le \pi$, Expand f(x) by Fourier cosine series (15%)

(8)



$-\pi \le x \le \pi$, Expand f(x) by Fourier series (20%)