Unit 4 - Week 3

Assignment 3

The due date for submitting this assignment has passed. **Due on 2018-09-05, 23:59 IST.**
As per our records you have not submitted this assignment.

1) *0 points*

$The\ symmetric\ Fredholm\ integral\ equation\ y(x) = f(x) + \lambda \int_{-1}^{1} x^3 t^3 y(t)dt,\ has$

- $no\ solution\ for\ \lambda = \frac{7}{2}\ and\ f(x) = x$
- $a\ unique\ solution\ for\ \lambda = \frac{2}{7}\ and\ f(x) = x$
- $a\ unique\ solution\ for\ \lambda = \frac{7}{2}\ and\ f(x) = x^2$
- $no\ solution\ for\ \lambda = \frac{2}{7}\ and\ f(x) = x^2.$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$a\ unique\ solution\ for\ \lambda = \frac{2}{7}\ and\ f(x) = x$

2) *1 point*

$The\ symmetric\ Fredholm\ integral\ equation\ y(x) = e^x + \lambda \int_{-1}^{1} (xt + 2t + 2x + 4)y(t)dt,\ has$

- $no\ solution\ for\ \lambda = \frac{1}{9}$
- $a\ unique\ solution\ for\ \lambda = \frac{1}{9}$
- $infinitely\ many\ solutions\ for\ \lambda = \frac{3}{26}$
- $a\ unique\ solution\ for\ \lambda = \frac{3}{26}\ .$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$a\ unique\ solution\ for\ \lambda = \frac{1}{9}$

3) *1 point*

Week 12

WEEKLY FEEDBACK

DOWNLOAD VIDEOS

Devel

$infinitely\ many\ solutions\ for\ \lambda = 1\ and\ f(x) = \cos x$

$unique\ solution\ for\ \lambda = \pi\ and\ f(x) = \sin x.$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$unique\ solution\ for\ \lambda = \pi\ and\ f(x) = \sin x.$

4) *1 point*

$Consider\ the\ Fredholm\ integral\ equation\ y(x) = f(x) + \lambda \int_0^{2\pi} (\sin x + \sin t) y(t) dt.$
$Then\ it\ has$

$no\ solution\ for\ \lambda = \frac{1}{\pi},\ f(x) = \sin x$

$unique\ solution\ for\ \lambda = \frac{1}{\pi\sqrt{2}},\ f(x) = \sin x$

$unique\ solution\ for\ \lambda = 1,\ f(x) = \cos x$

$infinitely\ many\ solutions\ for\ \lambda = \frac{1}{\pi\sqrt{2}},\ f(x) = \sin x.$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$unique\ solution\ for\ \lambda = 1,\ f(x) = \cos x$

5) $Consider\ the\ following\ symmetric\ Fredholm\ integral\ equation$ *1 point*

$\sin 4x = \lambda \int_0^{\pi/2} K(x,t) y(t) dt,\ where$

$$K(x,t) = \begin{cases} \sin x \cos t, & 0 \le x \le t; \\ \sin t \cos x, & t \le x \le \pi/2. \end{cases}$$

$Then\ it\ has$

$no\ solution\ for\ all\ value\ of\ \lambda$

$unique\ solution\ y(x) = \sin 4x\ for\ only\ one\ value\ of\ \lambda$

$unique\ solution\ y(x) = \sin 4x\ for\ only\ two\ value\ of\ \lambda$

$None\ of\ these.$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$unique\ solution\ y(x) = \sin 4x\ for\ only\ one\ value\ of\ \lambda$

6) *0 points*

$Consider\ the\ following\ Fredholm\ integral\ equation\ y(x) = f(x) + \lambda \int_0^{2\pi} \sin(x+t) y(t) dt.\ Th$
$using\ Hilbert\ Schmidt\ theorem\ we\ obtain$

$y(x) = x + \frac{4}{3}(2\cos x + \sin x)\ for\ \lambda = \frac{2}{\pi}\ and\ f(x) = x.$

$y(x) = x + 2\cos x + \sin x\ for\ \lambda = \frac{1}{\pi}\ and\ f(x) = x.$

$y(x) = 1 + \sin x + \cos x\ for\ \lambda = -\frac{1}{\pi}\ and\ f(x) = 1.$

$y(x) = 1 + \sin x - \cos x \; for \; \lambda = -\frac{1}{\pi} \; and \; f(x) = 1.$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$y(x) = x + \frac{4}{3}\,(2\cos x + \sin x) \; for \; \lambda = \frac{2}{\pi} \; and \; f(x) = x.$

7) $Consider\ the\ differential\ equation\ 2y''(x) + y'(x) + xy(x) = 0,\ and\ let\ the\ function\ v(x)\ be\ defined\ as$ **1 point**

$v(x)[2y''(x) + y'(x) + xy(x)] = [A(x)y'(x) + B(x)y(x)]'$

$for\ some\ twice\ differentiable\ functions\ A(x)\ and\ B(x).\ Then$

- $v(x)\ is\ a\ solution\ of\ the\ equation\ 2y''(x) + y'(x) + xy(x) = 0$
- $v(x)\ is\ a\ solution\ of\ the\ equation\ 2y''(x) - y'(x) + xy(x) = 0$
- $v(x)\ is\ a\ solution\ of\ the\ equation\ 2y''(x) + xy(x) = 0$
- $none\ of\ the\ above.$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$v(x)\ is\ a\ solution\ of\ the\ equation\ 2y''(x) - y'(x) + xy(x) = 0$

8) **1 point**

$Consider\ the\ Fredholm\ integral\ equation\ y(x) = x + \lambda \int_0^1 e^{x+t} y(t)dt.\ Then\ it\ has\ a\ solution$

- $y(x) = x + \frac{2e^x}{3-e^2} \; for \; \lambda = \frac{1}{e^2-1}$
- $y(x) = x + \frac{2e^x}{e^2-1} \; for \; \lambda = 1$
- $y(x) = x + \frac{2e^x}{3-e^2} \; for \; \lambda = 1$
- $y(x) = x + \frac{2e^x}{e^2-1} \; for \; \lambda = -1.$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$y(x) = x + \frac{2e^x}{3-e^2} \; for \; \lambda = 1$

9) **1 point**

$Consider\ the\ differential\ equation\ x^2y'' + xy' - 4y = 0\ with\ appropriate\ boundary\ conditio$
$Then\ the\ adjoint\ equation\ is\ given\ by$

- $x^2v'' + 3xv' - 3v = 0$
- $x^2v'' - 3xv' - 4v = 0$
- $x^2v'' - xv' - 4v = 0$
- $None\ of\ these.$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$x^2v'' + 3xv' - 3v = 0$

10) **1 point**

Consider the boundary value problem $y''(x) + 2y'(x) + y(x) = f(x)$ *with the boundary condit* $y(0) = 0 = y(1)$. *Then the Green's function* $G(\xi, x)$ *for the given boundary value problem is*

$$G(\xi, x) = \begin{cases} \xi(x-1)e^{\xi - x}, & 0 \le \xi \le x; \\ xe^{\xi - x}(\xi - 1), & x < \xi \le 1. \end{cases}$$

$$G(\xi, x) = \begin{cases} (\xi-1)xe^{\xi - x}, & 0 \le \xi \le x; \\ \xi e^{\xi - x}(x - 1), & x < \xi \le 1. \end{cases}$$

$$G(\xi, x) = \begin{cases} (\xi-1)\xi e^{\xi - x}, & 0 \le \xi \le x; \\ \xi(\xi - 1)e^{x-\xi}, & x < \xi \le 1. \end{cases}$$

None of these.

No, the answer is incorrect.
Score: 0

Accepted Answers:
None of these.

Previous Page

End