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Courses » Integral Equations,calculus of variations and its applications

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Unit 7 - Week 6

Course outline

Assignment 6

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2018-09-12, 23:59 IST.

1) $With\ the\ aid\ of\ resolvent\ kernel,\ the\ solution\ of\ the\ integral\ equation$ ***1 point***
$\phi(x) = 1 - 2x - \int_0^x e^{x^2-t^2}\phi(t)dt,\ is$

- $e^{x^2-x}(1+2x)$
- $e^{x^2-x} - 2x$
- e^{x^2-x}
- $e^{x^2-x} + 2x$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$e^{x^2-x} - 2x$

2) $With\ the\ aid\ of\ resolvent\ kernel,\ the\ solution\ of\ the\ integral\ equation$ ***1 point***
$\phi(x) = xe^{\frac{x^2}{2}} + \int_0^x e^{-(x-t)}\phi(t)dt\ is$

- $e^{\frac{x^2}{2}}(x+1) - 1$
- $e^{\frac{x^2}{2}}(x+1)$
- $e^{\frac{x^2}{2}}$ ...

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Accepted Answers:
$e^{\frac{x^2}{2}}(x+1)-1$

3) $The\ solution\ of\ the\ convolution\ type\ integral\ equation$ *1 point*
$\phi(x) = e^x + 2\int_0^x \cos(x-t)\phi(t)dt,\ is$

- e^x
- $e^x(1+x)$
- $e^x(1+x)^2$
- $e^x(1+x^2)$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$e^x(1+x)^2$

4) $The\ solution\ of\ the\ convolution\ type\ integral\ equation$ *1 point*
$\phi(x) = e^{2x} + \int_0^x e^{t-x}\phi(t)dt\ is$

- e^{2x}
- $\frac{e^{2x}}{2}$
- $(3e^{2x}-1)$
- $\frac{(3e^{2x}-1)}{2}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\frac{(3e^{2x}-1)}{2}$

5) $The\ solution\ of\ the\ system\ of\ integral\ equations$ *1 point*
$\phi_1(x) = e^{2x} + \int_0^x \phi_2(t)dt,$
$\phi_2(x) = 1 - \int_0^x e^{2(x-t)}\phi_1(t)dt,$
is

- $\phi_1(x) = e^x - 2,\ \ \phi_2(x) = 2e^x - 3e^{2x}$
- $\phi_1(x) = 3e^x - 2,\ \ \phi_2(x) = 2e^x - 3e^{2x}$
- $\phi_1(x) = 3e^x - 2,\ \ \phi_2(x) = 3e^x - 2e^{2x}$
- $\phi_1(x) = e^x - 2,\ \ \phi_2(x) = 3e^x - 2e^{2x}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\phi_1(x) = 3e^x - 2,\ \phi_2(x) = 3e^x - 2e^{2x}$

6) $The\ solution\ of\ the\ system\ of\ integral\ equations$ **1 point**

$\phi_1(x) = x + \int_0^x \phi_2(t)dt$

$\phi_2(x) = 1 - \int_0^x \phi_1(t)dt$

$\phi_3(x) = \sin x + \frac{1}{2}\int_0^x (x-t)\phi_1(t)dt,\ is$

- $\phi_1(x) = 2\sin x,\ \phi_2(x) = 2\cos x,\ \phi_3(x) = x$
- $\phi_1(x) = 2\sin x,\ \phi_2(x) = 2\cos x + 1,\ \phi_3(x) = x^2$
- $\phi_1(x) = 2\sin x,\ \phi_2(x) = 2\cos x - 1,\ \phi_3(x) = x^2$
- $\phi_1(x) = 2\sin x,\ \phi_2(x) = 2\cos x - 1,\ \phi_3(x) = x$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\phi_1(x) = 2\sin x,\ \phi_2(x) = 2\cos x - 1,\ \phi_3(x) = x$

7) $The\ solution\ of\ the\ Cauchy\ type\ integral\ equation$ **1 point**

$$x^2 = \int_2^x \frac{y(t)dt}{(x^2-t^2)^{\frac{1}{2}}} \quad 2 < x < 4\ is$$

- $y(x) = \frac{4x(x^2-2)(x^2+4)^{\frac{-1}{2}}}{\pi}$
- $y(x) = \frac{4x(x^2+2)(x^2-4)^{\frac{-1}{2}}}{\pi}$
- $y(x) = \frac{4x(x^2-2)(x^2-4)^{\frac{-1}{2}}}{\pi}$
- $y(x) = \frac{4(x^2-2)(x^2-4)^{\frac{-1}{2}}}{\pi}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$y(x) = \frac{4x(x^2-2)(x^2-4)^{\frac{-1}{2}}}{\pi}$

8) $The\ solution\ of\ the\ Cauchy\ integral\ equation\ x = \int_x^4 \frac{g(t)dt}{(t-x)^{\frac{1}{3}}}\ ,\ is$ **1 point**

- $g(x) = \frac{-3}{2\pi}(4-x)^{\frac{2}{3}}(8-3x)$
- $g(x) = \frac{-3\sqrt{3}}{2\pi}(4-x)^{\frac{-2}{3}}(8-3x)$
- $g(x) = \frac{-3}{2\pi}(4-x)^{\frac{2}{3}}(3x-8)$

$g(x) = \frac{\sqrt{3}}{2\pi}(4-x)^{\frac{-2}{3}}(3x-8)$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$g(x) = \frac{\sqrt{3}}{2\pi}(4-x)^{\frac{-2}{3}}(3x-8)$

9) *The solution of Cauchy type integral equation* **1 point**

$$1 = \int_{\frac{\pi}{2}}^{x} \frac{g(t)dt}{(\cos t - \cos x)^{\frac{1}{2}}}, \quad \frac{\pi}{2} < x < \pi \; is$$

$g(t) = \frac{1}{\pi}(\sin t)(-\cos t)^{\frac{1}{2}}$

$g(t) = \frac{1}{\pi}(\sin t)(-\cos t)^{\frac{-1}{2}}$

$g(t) = \frac{1}{\pi}(-\cos t)^{\frac{1}{2}}$

$g(t) = \frac{-1}{\pi}(\sin t)(-\cos t)^{\frac{-1}{2}}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$g(t) = \frac{1}{\pi}(\sin t)(-\cos t)^{\frac{-1}{2}}$

10) *The solution of the Cauchy type integral equation* **1 point**

$$x = \int_{x}^{4} \frac{u(t)dt}{(t-x)^{\frac{1}{4}}} \quad 2 < x < 4 \; is$$

$u(t) = \frac{-16}{5\sqrt{2}\pi}(4-t)^{\frac{1}{4}}(t+1)$

$u(t) = \frac{-2\sqrt{2}}{\pi}(4-t)^{\frac{-3}{4}}(3-t)$

$u(t) = \frac{-2\sqrt{2}}{\pi}(4-t)^{\frac{-3}{4}}(5-t)$

$u(t) = \frac{-2\sqrt{2}}{\pi}(4-t)^{\frac{3}{4}}(3-t)$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$u(t) = \frac{-2\sqrt{2}}{\pi}(4-t)^{\frac{-3}{4}}(3-t)$

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