

Question 1

Not yet answered

Marked out of 3

Flag question

Let  $y(t)$  be the solution of the initial value problem  $xy' - y = 1$ ,  $y(1) = 2$ , then  $y(2) =$

Select one:

- 3
- 0
- 2
- 5

[Clear my choice](#)

Question 2

Not yet answered

Marked out of 3

Flag question

The solution of the I.V.P.  $y' = 2xy^2 + 3x^2y^2$ ,  $y\left(\frac{-1}{2}\right) = -8$  is defined on the interval

Select one:

- $(0, \infty)$
- $(0, 1)$
- $(-1, \infty)$
- $(-1, 0)$

[Clear my choice](#)



## Question 3

Not yet answered

Marked out of 3

Flag question

The solution of the integral equation

$$\phi(t) - \int_0^t e^{-(t-\tau)} \phi(\tau) d\tau = 1$$
 is

Select one:

- $\phi(t) = 1 - e^t$
- $\phi(t) = t - e^t$
- $\phi(t) = 1 + t$
- $\phi(t) = 1 - t$

[Clear my choice](#)

## Question 4

Not yet answered

Marked out of 3

Flag question

The I.V.P.  $\ln(t-1)y' + \frac{1}{t-1}y = \csc t$ ,  $y(3) = 1$  is certain to have a solution in the interval

Select one:

- $(0, 3)$
- $(0, \pi)$
- $(1, \pi)$
- $(2, \pi)$

[Clear my choice](#)

## Question 5

Not yet answered

Marked out of 3

Flag question

The general solution of the differential equation  $2y'' - y' - y = 0$  is

Select one:

- $y(t) = c_1e^{-t/2} + c_2e^{-t}$
- $y(t) = c_1e^{-t/2} + c_2e^t$
- $y(t) = c_1e^{t/2} + c_2e^t$
- $y(t) = c_1e^{t/2} + c_2e^{-t}$

[Clear my choice](#)

## Question 6

Not yet answered

Marked out of 3

Flag question

Let  $y_1$  and  $y_2$  be two solutions of the differential equation  $t^2y'' - (2t + t^2)y' + y = 0$ , and  $W(y_1, y_2)(1) = e$ , then  $W(y_1, y_2)(\ln 2) =$

Select one:

- $\ln 2$
- $2(\ln 2)^2$
- $2 \ln 2$
- $(\ln 2)^2$

[Clear my choice](#)

## Question 7

Not yet answered

Marked out of 3

Flag question

A lower bound for the radius of convergence of series solution of the differential equation

$$(x^2 - 2x + 2)y'' + xy' + y = 0 \text{ near } x_0 = -\frac{1}{2} \text{ is}$$

Select one:

- $\frac{\sqrt{5}}{2}$
- $\sqrt{5}$
- $\frac{\sqrt{13}}{2}$
- $\sqrt{2}$

[Clear my choice](#)

## Question 8

Not yet answered

Marked out of 3

Flag question

A solution of the system  $\mathbf{x}' = \begin{pmatrix} 1 & 0 \\ 1 & 2 \end{pmatrix} \mathbf{x}$  is

Select one:

- $\mathbf{x}(t) = \begin{pmatrix} 0 \\ 1 \end{pmatrix} e^t$
- $\mathbf{x}(t) = \begin{pmatrix} 1 \\ -1 \end{pmatrix} e^t$
- $\mathbf{x}(t) = \begin{pmatrix} 1 \\ 0 \end{pmatrix} e^t$



Flag question

Select one:

- $\frac{\sqrt{5}}{2}$
- $\sqrt{5}$
- $\frac{\sqrt{13}}{2}$
- $\sqrt{2}$

[Clear my choice](#)

**Question 8**

Not yet answered

Marked out of 3

Flag question

A solution of the system  $\mathbf{x}' = \begin{pmatrix} 1 & 0 \\ 1 & 2 \end{pmatrix} \mathbf{x}$  is

Select one:

- $\mathbf{x}(t) = \begin{pmatrix} 0 \\ 1 \end{pmatrix} e^t$
- $\mathbf{x}(t) = \begin{pmatrix} 1 \\ -1 \end{pmatrix} e^t$
- $\mathbf{x}(t) = \begin{pmatrix} 1 \\ 0 \end{pmatrix} e^t$
- $\mathbf{x}(t) = \begin{pmatrix} -1 \\ -1 \end{pmatrix} e^t$

[Clear my choice](#)



Question 9

Not yet answered

Marked out of 3

Flag question

A particular solution of the differential equation  $y'' = 24t^2$  is

Select one:

- $Y(t) = 2t^4$
- $Y(t) = t^4 + 1$
- $Y(t) = 3t^4$
- $Y(t) = 4t^2$

[Clear my choice](#)

Question 10

Not yet answered

Marked out of 3

Flag question

The solution of the I.V.P.  $x \frac{dy}{dx} = y + y \ln\left(\frac{y}{x}\right)$ ,  $x > 0$ ,  $y(1) = e$  is

Select one:

- $y = xe^x$
- $y = x \ln x$
- $y = x^2 e^x$
- $y = xe^{x^2}$

[Clear my choice](#)



## Question 11

Not yet answered

Marked out of 3

Flag question

The general solution of the differential equation  $t^2y'' + 5ty' + 4y = 0, t > 0$  is

Select one:

- $y(t) = c_1t^{-1} + c_2t^{-4}$
- $y(t) = c_1t^{-2} + c_2t^{-2} \ln t$
- $y(t) = c_1t^2 + c_2t^4$
- $y(t) = c_1e^{-t} + c_2e^{-4t}$

[Clear my choice](#)

## Question 12

Not yet answered

Marked out of 3

Flag question

The Laplace transform of the solution of the initial value problem  $y'' + ty' + y = 0, y(0) = 0, y'(0) = 0$  satisfies the equation

Select one:

- $2Y(s) - sY'(s) = 0$
- $Y(s) + Y'(s) = 0$
- $sY(s) - Y'(s) = 0$
- $Y(s) + sY'(s) = 0$

[Clear my choice](#)

## Question 13

Not yet answered

Marked out of 3

Flag question

A certain object initially at  $50^\circ\text{F}$  is put into a  $375^\circ\text{F}$  oven. Using Newton's law of heating  $u'(t) = (\ln 5)(375 - u(t))$ , the temperature of the object at  $t = 1$  is

Select one:

- $375^\circ\text{F}$
- $310^\circ\text{F}$
- $365^\circ\text{F}$
- $315^\circ\text{F}$

[Clear my choice](#)

## Question 14

Not yet answered

Marked out of 3

Flag question

The Laplace transform of the function

$$f(t) = \begin{cases} t & , \quad 0 \leq t < 1 \\ 1 & , \quad t \geq 1 \end{cases} \text{ is}$$

Select one:

- $\frac{1+e^{-s}}{s}$
- $\frac{1}{s} + \frac{e^{-s}}{s^2}$
- $1 + \frac{e^{-s}}{s}$
- $\frac{1-e^{-s}}{s^2}$





## Question 15

Not yet answered

Marked out of 3

Flag question

Let  $y(x) = \sum_{n=0}^{\infty} a_n x^n$  be the series solution of the initial value problem  $y'' + (\cos x)y' + y = 0$ ,  $y(0) = 2$ ,  $y'(0) = 1$ , then  $a_3 =$

Select one:

- 2
- 1
- $\frac{1}{3}$
- $\frac{1}{6}$

[Clear my choice](#)

## Question 16

Not yet answered

Marked out of 3

Flag question

One of the following is a solution of the initial value problem  $xyy' = 1$ ,  $y(1) = 1$

Select one:

- $y = \sqrt{\ln x^2 + 2}$
- $y = \ln x + 1$
- $y = \sqrt{\ln x^2 + 1}$
- $y = \ln x^2 + 1$

[Clear my choice](#)

Question 17

Not yet answered

Marked out of 3

Flag question

The Laplace transform of the function  $f(t) = u_{\frac{\pi}{2}}(t) \sin t$  is

Select one:

- $-\frac{se^{-\frac{\pi}{2}s}}{s^2+1}$
- $\frac{e^{-\frac{\pi}{2}s}}{s^2+1}$
- $-\frac{e^{-\frac{\pi}{2}s}}{s^2+1}$
- $\frac{se^{-\frac{\pi}{2}s}}{s^2+1}$

[Clear my choice](#)

Question 18

Not yet answered

Marked out of 3

Flag question

If  $Y(t) = v_1(t) \cos t + v_2(t) \sin t$  is a particular solution of  $y'' + y = \sec t$ , then  $v_1\left(\frac{\pi}{3}\right) =$

Select one:

- $-\ln(2)$
- 0
- 1
- $\frac{1}{2}$



## Question 19

Not yet answered

Marked out of 3

Flag question

Let  $y(x)$  be the solution of the I.V.P.

$$(2xy + 1) + (x^2 + 1)y' = 0, y(1) = 1, \text{ then } y(3) =$$

Select one:

- 1
- 2
- 0
- 3

[Clear my choice](#)

## Question 20

Not yet answered

Marked out of 3

Flag question

The solution of the I.V.P.  $y'' + y = (t - 1)u_1(t)$ ,  $y(0) = 0$ ,  $y'(0) = 0$  is

Select one:

- $((t - 1) - \sin(t - 1))u_1(t)$
- $(t - \sin t)u_1(t)$
- $((t - 1) + \sin(t - 1))u_1(t)$
- $(t - 1) - \sin(t - 1)$

[Clear my choice](#)

Question 21

Not yet answered

Marked out of 3

Flag question

The differential equation  $(x^2 + y^2) + 2xy \frac{dy}{dx} = 0$  is

Select one:

- homogeneous and exact
- exact and separable
- separable and homogeneous
- linear and exact

[Clear my choice](#)

Question 22

Not yet answered

Marked out of 3

Flag question

The general form of a particular solution of  $y''' - 3y'' + 3y' - y = te^t$  is

Select one:

- $Y(t) = (At^3 + Bt^2)e^t$
- $Y(t) = (At + B)e^t$
- $Y(t) = (At^4 + Bt^3)e^t$
- $Y(t) = (At^2 + Bt)e^t$

[Clear my choice](#)



## Question 23

Not yet answered

Marked out of 3

Flag question

The Laplace transform of  $\int_0^t \sinh(t - \tau) \sin(\tau) d\tau$  is

Select one:

- $\frac{s}{(s^2+1)^2}$
- $\frac{s}{s^4-1}$
- $\frac{1}{s^4-1}$
- $\frac{1}{(s^2+1)^2}$

[Clear my choice](#)

## Question 24

Not yet answered

Marked out of 3

Flag question

The general solution of the differential equation  $y^{(4)} - 8y'' + 16y = 0$  is

Select one:

- $y = c_1 e^{2t} + c_2 t e^{2t} + c_3 e^{-2t} + c_4 t e^{-2t}$
- $y = c_1 e^{-2t} + c_2 e^{2t} + c_3 \sin(2t) + c_4 \cos(2t)$
- $y = c_1 e^{2t} + c_2 t e^{2t} + c_3 t^2 e^{2t} + c_4 e^{-2t}$
- $y = c_1 \cos(2t) + c_2 t \cos(2t) + c_3 \sin(2t) + c_4 t \sin(2t)$

[Clear my choice](#)