

Question No : 1 of 26

Marks: 1 (Budgeted Time 1 Min)

The form of the exact solution to

$$2 \frac{dy}{dx} + 3y = e^{-x}, y(0) = 5$$

is

Answer ( Please select your correct option )

☐  $Ae^{-1.5x} + Bxe^{-x}$

☐  $Ae^{1.5x} + Be^{-x}$

☐  $Ae^{1.5x} + Bxe^{-x}$

☐  $Ae^{-1.5x} + Be^{-x}$

correct answer solve  
by hadi

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VU Examination System (CLIENT) VUTES 6.5 : Fall 2012 (MidTerm)

Question No : 2 of 26 Marks: 1 (Budgeted Time 1 Min)

The Period of oscillator in the solution  $X=50\sin(20t+8.5)$  is

Answer ( Please select your correct option )

- ☐ 0.17643
- ☐ 0.32045
- ☐ 0.31400
- ☐ 0.58000

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Question No : 2 of 26

Marks: 1 (Budgeted Time 1 Min)

The Period of oscillator in the solution  $X=50\sin(20t+8.5)$  is

Answer ( Please select your correct option )

☐ 0.17643

☐ 0.32045

☐ 0.31400

☐ 0.58000

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Question No : 3 of 26

Marks: 1 (Budgeted Time 1 Min)

A problem of the differential equation associated with a single value of the unknown function at a given point in the domain of the solution is known as -----

Answer ( Please select your correct option )

☐ Boundary Value Problem

☐ Initial Value Problem

☐ None of these

correct answer solve  
by hadi

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Question No : 4 of 26

Marks: 1 (Budgeted Time 1 Min)

The equation  $\frac{dy}{dx} = \frac{x(x+1)}{y(y-1)}$  is a/an -----

Answer ( Please select your correct option )

☐ partial differential equation.

correct answer solve  
by hadi

☐ ordinary differential equation.

☐ polynomial equation.

☐ transcendental equation.

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Question No : 5 of 26 Marks: 1 (Budgeted Time 1 Min)

If  $f(x, y) = 0$ , then  $\frac{dy}{dx} = \dots$

Answer ( Please select your correct option )

- ☐  $-\frac{f_x}{f_y}$
- ☐  $-\frac{f_y}{f_x}$
- ☐  $\frac{f_x}{f_y}$
- ☐  $\frac{f_y}{f_x}$

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Question No : 6 of 26

Marks: 1 (Budgeted Time 1 Min)

For  $y^2(1-x^2) - \cos^2 x = c$  with  $y(0) = 3$ , the value of  $c$  is -----.

Answer ( Please select your correct option )

☐ 9

☐ 8

correct answer solve  
by hadi

☐ 10

☐ 5

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Question No : 7 of 26

Marks: 1 (Budgeted Time 1 Min)

The differential equation  $(3x^2y + 2) dx + (x^3 + y) dy = 0$  is -----.

Answer ( Please select your correct option )

☐ Exact

correct answer solve  
by hadi

☐ Non-exact

☐ Separable

☐ Homogenous

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Question No : 8 of 26

Marks: 1 (Budgeted Time 1 Min)

For a 1st order linear differential equation  $\frac{dy}{dt} - \frac{1}{t}y = 2t$ ; the continuous function,  $q(t)$ , is.....

Answer ( Please select your correct option )

- ☐  $2t$
- ☐  $-\frac{1}{t}$
- ☐  $\frac{1}{t}$
- ☐  $t$

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Question No : 9 of 26 Marks: 1 (Budgeted Time 1 Min)

For a 1st order linear differential equation  $\frac{dy}{dx}(x + 2y^2) = y$ ; The continuous function,  $q(y)$ , is---

Answer ( Please select your correct option )

☐  $x^2$

☐  $2y$

☐  $2y^2$

☐  $-2y$

correct answer solve by hadi

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Question No : 10 of 26

Marks: 1 (Budgeted Time 1 Min)

A differential equation  $\frac{dy}{dx} + p(x)y = q(x)y^n$  for  $n \neq 0, 1$  is called a/an ----.

Answer ( Please select your correct option )

☐ Non-Exact differential equation

☐ Linear differential equation

☐ Bernoulli equation

correct answer solve  
by hadi

☐ Exact differential equation

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Question No : 11 of 26

Marks: 1 (Budgeted Time 1 Min)

The constant solutions of the logistic equation  $\frac{dP}{dt} = P(a - bP)$  are-----.

Answer ( Please select your correct option )

☐ P=0, P= b/a

☐ P=0, P=a/b

correct answer solve  
by hadi

☐ P=a/b, P=b/a

☐ P=0, P=0

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Question No : 12 of 26

Marks: 1 (Budgeted Time 1 Min)

The logistic equation  $\frac{dP}{dt} = P(a - bP)$  is a/an-----.

Answer ( Please select your correct option )

☐ Linear differential equation

☐ Non-linear differential equation

correct answer solve  
by hadi

☐ Homogenous differential equation

☐ Exact differential equation

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Question No : 13 of 26

Marks: 1 (Budgeted Time 1 Min)

Wronskian of  $\sin x, \cos x$  is----

Answer ( Please select your correct option )

☐  $\sin x$

☐ 1

☐ -1  
correct answer solve  
by hadi

☐  $\cos x$

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Question No : 14 of 26 Marks: 1 (Budgeted Time 1 Min)

What is annihilator operator of the function  $\frac{dy}{dx} + 4y = e^{2x}$  ?

Answer ( Please select your correct option )

- ☐  $(D+4)(D-2)$
- ☐  $(D-2)$
- ☐  $(D+2)$
- ☐  $D(D^2-2)$

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Question No : 15 of 26

Marks: 1 (Budgeted Time 1 Min)

What is the annihilator operator of the function  $g(x) = \cos 2x$ ?

Answer ( Please select your correct option )

☐  $(D - 4)$

☐  $(D + 4)$

☐  $(D^2 + 4)$

☐  $(D^3 - 4)$

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Question No : 16 of 26

Marks: 1 (Budgeted Time 1 Min)

The differential equation of the orthogonal trajectory to the family of curves  $y = cx$  is-----.

Answer ( Please select your correct option )

☐  $\frac{dy}{dx} = -\frac{x}{y}$

☐  $\frac{dy}{dx} = \frac{x}{y}$

☐  $\frac{dy}{dx} = -\frac{y}{x}$

☐  $\frac{dy}{dx} = \frac{y}{x}$

correct answer solve  
by hadi

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Question No : 17 of 26

Marks: 1 (Budgeted Time 1 Min)

The orthogonal trajectory to the family of curves  $3x + 4y = c$  is-----.

Answer ( Please select your correct option )

☐  $y = 2x$

☐  $y - x = c$

☐  $4x - 3y = c$

☐  $4x + 3y = c$

correct answer solve  
by hadi

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Question No : 18 of 26

Marks: 1 (Budgeted Time 1 Min)

In the population growth model, the solution of the differential equation is given by .....

Answer ( Please select your correct option )

☐  $A(t) = ke^{kt}$

☐  $A(t) = A_0 e^{kt}$

correct answer solve  
by hadi

☐  $A(t) = A_0 / 2$

☐  $A(t) = ke^{At}$

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Question No : 19 of 26 Marks: 1 (Budgeted Time 1 Min)

If  $y_2 = x^3$  is the second solution of  $x^2 \frac{d^2 y}{dx^2} - x \frac{dy}{dx} - 3y = 0$ , then which of the following is the most accurate option?

Answer ( Please select your correct option )

- ☐ The first solution say  $y_1$  must be non-trivial on the indicated interval.
- ☐ The first solution say  $y_1$  can be trivial on the indicated interval.
- ☐ The first solution say  $y_1$  must be discontinuous on the indicated interval.
- ☐ The first solution say  $y_1$  may or may not be continuous on the indicated interval.

correct answer solve by hadi

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Question No : 20 of 26

Marks: 1 (Budgeted Time 1 Min)

If the complementary solution of  $\frac{d^2y}{dx^2} - \frac{dy}{dx} - 2y = 3\sin x$  is  $c_1 e^{-x} + c_2 e^{2x}$ , then which of the following is the most accurate option for it?

Answer ( Please select your correct option )

- ☐ The general form of the particular solution will be  $(A \sin x + B \cos x)e^x$ .
- ☐ The general form of the particular solution will be  $Ax \sin x + Bx \cos x$ .
- ☐ The general form of the particular solution will be  $(Ax \sin x + Bx \cos x)e^{-x}$ .
- ☐ The general form of the particular solution will be  $A \sin x + B \cos x$ .

correct answer solve  
by hadi

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Question No : 21 of 26 Marks: 2 (Budgeted Time 4 Min)

If a mass weighing  $20/b$  stretches a spring by  $\frac{1}{2} ft$  then find  $k$  using the Hooke's Law.

Answer ( Please [click here](#) to Add Answer )

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Marks: 2 (Budgeted Time 4 Min)

Answer ( Please [click here](#) to Add Answer )

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Question No : 22 of 26 Marks: 2 (Budgeted Time 4 Min)

Show that  $y = x^2$  is a solution of the following differential equation:

$$x^2 \frac{d^2 y}{dx^2} - 3x \frac{dy}{dx} + 4y = 0$$

Answer ( Please [click here](#) to Add Answer )

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Question No : 22 of 26

Marks: 2 (Budgeted Time 4 Min)

Show that  $y = x^2$  is a solution of the following differential equation:

$$x^2 \frac{d^2 y}{dx^2} - 3x \frac{dy}{dx} + 4y = 0$$

Answer ( [Please click here to Add Answer](#) )



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Question No : 23 of 26 Marks: 3 (Budgeted Time 6 Min)

What is Logistic equation, write it mathematically?

Answer ( Please [click here](#) to Add Answer )

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Question No : 23 of 26

Marks: 3 (Budgeted Time 6 Min)

What is Logistic equation, write it mathematically?

Answer ( [Please click here to Add Answer](#) )

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Question No : 24 of 26 Marks: 3 (Budgeted Time 6 Min)

Write the following differential equation in the form  $L(y) = g(x)$ , where  $L$  is a linear differential operator with constant coefficients.

$$\frac{d^2 y}{dx^2} - 2 \frac{dy}{dx} + 5y = 2 \sin x$$

Answer ( Please [click here](#) to Add Answer )

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Question No : 24 of 26

Marks: 3 (Budgeted Time 6 Min)

Write the following differential equation in the form  $L(y) = g(x)$ , where  $L$  is a linear differential operator with constant coefficients.

$$\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + 5y = 2\sin y$$

Answer ( [Please click here to Add Answer](#) )



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VU Examination System (CLIENT) VUTES 6.5 : Fall...

Question No : 25 of 26 Marks: 5 (Budgeted Time 10 Min)

Find the wronskian of the Differential equation  $y''' - 2y'' - 21y' - 18y = 3 + 4e^{-t}$  using variation of parameter and the root of the auxiliary equation is  $m_1 = -3, m_2 = -1, m_3 = 6$ ?

Answer ( Please click here to Add Answer )

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Question No : 25 of 26

Marks: 5 (Budgeted Time 10 Min)

Find the wronskian of the Differential equation  $y''' - 2y'' - 21y' - 18y = 3 + 4e^{-x}$  using variation of parameter and the root of the auxiliary equation is  $m_1 = -3, m_2 = -1, m_3 = 6$  ?

Answer ( Please [click here](#) to Add Answer )



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Question No : 26 of 26 Marks: 5 (Budgeted Time 10 Min)

Solve the boundary value problem  $\frac{d^2y}{dx^2} + 25y = 0$  subject to the boundary conditions  $y(0) = 0$ ,  $y\left(\frac{\pi}{10}\right) = 0$

Answer ( Please [click here](#) to Add Answer )

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Question No : 26 of 26

Marks: 5 (Budgeted Time 10 Min)

Solve the boundary value problem  $\frac{d^2y}{dx^2} + 25y = 0$  subject to the boundary conditions  $y(0) = 0$ ,  $y\left(\frac{\pi}{10}\right) = 0$

Answer ( [Please click here to Add Answer](#) )

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