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Best of luck!

PAST PAPER

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

A solution obtained by giving particular values to the arbitrary constants in the General Solution of a differential equation is called a ----------

Answer (Please select your correct option)

- Singular solution
- Particular solution



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- Explicit Solution
- None of these

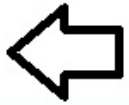
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Question No : 2 of 26 Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

- partial differential equation.
- ordinary differential equation.
- polynomial equation.
- transcendental equation.



i think this ...because
in partial all value
write up and down ,,,,

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Question No : 3 of 26 Marks: 1 (Budgeted Time 1 Min)

A differential equation $M(x, y)\,dx + N(x, y)\,dy = 0$ is said to be non-exact if -----.

Answer (Please select your correct option)

- $\frac{\partial M}{\partial y} \neq \frac{\partial N}{\partial x}$
- $\frac{\partial M}{\partial y} = \frac{\partial N}{\partial y}$
- $\frac{\partial M}{\partial x} = \frac{\partial N}{\partial y}$
- $\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x}$

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Question No : 4 of 26 Marks: 1 (Budgeted Time 1 Min)

For a 1st order linear differential equation $\frac{dy}{dt} - \frac{1}{t}y = 2t^2$; the integarating factor will be -----.

Answer (Please select your correct option)

- $\mu = -\frac{1}{t}$
- $\mu = \frac{1}{t}$ ⇦ correct answer solve by hadi
- $\mu = t$
- $\mu = 2t$

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

In order to change the Bernoulli Equation

$$\frac{dy}{dx} + p(x)y = q(x)y^n$$

into linear differential equation, we choose ----.

Answer (Please select your correct option)

- $v = y^{n-1}$
- $v = y^{1-n}$ ⇦ correct answer solve by hadi
- $v = y^n$
- $v = y'$

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Question No : 6 of 26 Marks: 1 (Budgeted Time 1 Min)

The differential equation $\frac{dy}{dx} = \frac{x+2y-4}{2x+y-5}$ is not homogeneous. To convert it into homogeneous form, we use the substitution------.

Answer (Please select your correct option)

- $x = hX$
- $y = kY$
- $z = x+2y$
- $x = X+h\ ,\ y = Y+k$



correct answer solve
by hadi...but check it

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Question No : 7 of 26 Marks: 1 (Budgeted Time 1 Min)

Number of constant solutions obtained from the separable differential equation $\frac{dy}{dx} = \frac{y^3 - 1}{x}$ is---.

Answer (Please select your correct option)

- 0 
- 1
- 2
- 3

correct answer solve
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Question No : 8 of 26 Marks: 1 (Budgeted Time 1 Min)

In the 1st order linear differential equation, $\frac{dy}{dx}+\frac{y}{\ln x}=x^2$ find $p(x)$.

Answer (Please select your correct option)

- $\frac{y}{\ln x}$
- $\frac{1}{\ln x}$
- x^2
- $\frac{x^2}{\ln x}$

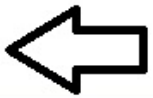
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Question No : 9 of 26 Marks: 1 (Budgeted Time 1 Min)

For a Ist order linear differential equation $\frac{dy}{dx} + y = x$, the integrating factor $\mu(x)$ is---.

Answer (Please select your correct option)

- x
- 1
- e^x
- e



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Question No : 10 of 26 Marks: 1 (Budgeted Time 1 Min)

In exponential model for the population growth $P(t) = P_0 e^{kt}$ *If* $k < 0$, *then* $\lim_{t \to \infty} P(t) = - - -$.

Answer (Please select your correct option)

- ∞
- 0
- $-\infty$
- 1

correct answer solve
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Question No : 11 of 26 Marks: 1 (Budgeted Time 1 Min)

What is other name of Logistic Model?

Answer (Please select your correct option)

- Epidemic Model
- Euler Model
- Verhulst Pearl Model 
- Gussain Model

correct answer solve
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Question No : 12 of 26 Marks: 1 (Budgeted Time 1 Min)

Wronskian of $Sin\ x, Cos\ x$ is----.

Answer (Please select your correct option)

- Sinx
- 1
- -1
- Cosx



correct answer solve
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Question No : 13 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)

- $(D+4)(D-2)$
- $(D-2)$
- $(D+2)$ ⇦ correct answer solve by hadi
- $D(D^2-2)$

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Question No : 14 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) ☆ i think this
- (D^3-4)

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Question No : 15 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 : 16 of 26 Marks: 1 (Budgeted Time 1 Min)

If T denotes the half life and the initial amount of the substance be A_0 , then the amount of radioactive substance at time T is given by--------.

Answer (Please select your correct option)

- $A(T) = \frac{A_0}{2}$ ⇦ correct answer solve by hadi
- $A(T) = \frac{T}{2}$
- $A(T) = A_0$
- $A(T) = \frac{kT}{2}$

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Question No : 17 of 26 Marks: 1 (Budgeted Time 1 Min)

If the auxiliary equation has complex roots $\pm i$, then the general solution of the differential equation is_____

Answer (Please select your correct option)

- $y = c_1 \cos x + c_2 \sin x$
- $y = ce^{2x}(\cos x + \sin x)$
- $y = e^{ix}(c_1 \cos x + c_2 \sin x)$ ⇦ correct answer solve by hadi...but check it
- $y = e^{x}(c_1 \cos x - c_2 \sin x)$

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Question No : 18 of 26 Marks: 1 (Budgeted Time 1 Min)

If the complementary solution of $\frac{d^2y}{dx^2} - 5\frac{dy}{dx} + 6y = 4e^{2x}$ is $c_1e^{2x} + c_2e^{3x}$, 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 Ae^{3x}.
- The general form of the particular solution will be Ae^{x}.
- The general form of the particular solution will be Ae^{2x}.
- The general form of the particular solution will be Axe^{2x}.

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

If $c_1 e^x$ and $c_2 x e^x$ are the solutions of $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = 0$, then which of the following is the most accurate option for $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = e^x$?

Answer (Please select your correct option)

- Its general form of the particular solution will be Ae^x.
- Its general form of the particular solution will be Axe^x.
- Its general form of the particular solution will be Ax^2e^x.
- Its general form of the particular solution will be Ax^3e^x.

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Question No : 20 of 26 Marks: 1 (Budgeted Time 1 Min)

If $e^{2x}\left(c_1 \cos 3x + c_2 \sin 3x\right)$ is the solution of $\frac{d^2y}{dx^2} - 4\frac{dy}{dx} + 13y = 0$, then which of the following is the most accurate option for $\frac{d^2y}{dx^2} - 4\frac{dy}{dx} + 13y = e^{2x}\sin 3x$?

Answer (Please select your correct option)

- Its general form of the particular solution will be $Ae^{2x} + B\sin x + C\cos x$.
- Its general form of the particular solution will be $e^{2x}\left(A\sin x + B\cos x\right)$.
- Its general form of the particular solution will be $e^{2x}\left(A\,x\,\sin x + B\,x\,\cos x\right)$. ⇦ correct answer solve by hadi.h
- Its general form of the particular solution will be $e^{2x}\left(A\,x\,\sin 3x + B\,x\,\cos 3x\right)$.

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

Show that the functions $f_1(x) = \sin x$ *and* $f_2(x) = x$ are linearly independent.

Answer (Please click here to Add Answer)

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

If the complementary solution of the following differential equation is $c_1 \sin 2x + c_2 \cos 2x$, then what will be the general form of its particular solution:

$$\frac{d^2y}{dx^2} + 4y = \cos 2x$$

Answer (Please click here to Add Answer)

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

Calculate the Wronskian of the following functions. Further determine whether they are linearly independent or not on the interval $(-\infty, \infty)$.

$f_1(x) = \sin^2 x$; $f_2(x) = \cos^2 x$

Answer (Please click here to Add Answer)



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

What will be the general form of the particular solution of the following differential equation:

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

Answer (Please click here to Add Answer)



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

Deduce the Special Case of Logistic Equation "Epidemic spread"?

Answer (Please click here to Add Answer)



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

Find the general solution of the following non-homogenous differential equation using annihilator operator

$y'' - 3y' + 2y = 4x^2 + 5$?

Answer (Please click here to Add Answer)





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