

## MTH401-Differential Equations Spring 2012 final term Paper

**Q: An electronic component of an electronic circuit that has the ability to store charge and opposes any change of voltage in the circuit is called**

**Inductor**

**Resistor**

**Capacitor**

**None of them**

**Q: If  $A_0$  is initial value and T denotes the half-life of the radioactive substance than**

$$T = \frac{1}{2A}$$

$$\frac{dA}{dt} = KA$$

$$A(T) = \frac{A_0}{2}$$

**None of the above**

**Q: integrating factor of the given equation  $x \cos x \frac{dy}{dx} + y(x \sin x + \cos x)$  is**

**Xsecx**

Cosx

Cotx

Xsinx

**Q: Operator method is the method of the solution of a system of linear homogeneous or linear non-homogeneous differential equations which is based on the process of systematic elimination of the**

**Dependent variables**

Independent variable

Choice variable  
None of them

Q: If  $E(t) = 0$ ,  $R = 0$  Electric vibration of the circuit is called\_\_\_\_\_

Free damped oscillation  
**Un- damped oscillation**  
Over damped oscillation  
None of the given

Q: Eigen value of a matrix  $\begin{pmatrix} 3 & 4 \\ -1 & 7 \end{pmatrix}$

**5, 5**

10, 5

25, 5

None

Q: Eigen value of a matrix  $\begin{pmatrix} 1 & 1 \\ 1 & 1 \end{pmatrix}$

2,0

1,1

1,2

None

$$A = \begin{pmatrix} 3 & 4 \\ -1 & 7 \end{pmatrix}$$

Q: For Eigen values  $\lambda = 5, 5$  of a matrix \_\_\_\_\_, there exists..... Eigen vectors.

infinite

**one**

two

three

Q: If a matrix has 1 row and 3 columns then the given matrix is called\_\_\_\_\_

Column matrix

Row matrix

Rectangular matrix

None

$$\frac{dy}{dx} = \frac{x+y}{x}$$

Q: The general solution of differential equation .is given by

$e^x = cx$

$e^x = cy$

$e^y = cx$

$e^y = cx$

Q: The integrating factor of the D.E  $\frac{dy}{dx} + y \ln y = ye^x$  is

$e^x$

$e^y$

$\frac{1}{e^x}$

$\frac{x}{e^y}$

Q: For the equation of free damped motion  $\frac{dx^2}{dt^2} + 2\lambda \frac{dx}{dt} + \omega^2 x = 0$  the roots are

$m_1 = -\lambda + \sqrt{\lambda^2 + \omega^2}$  &  $m_2 = -\lambda - \sqrt{\lambda^2 + \omega^2}$  if  $\lambda^2 - \omega^2 > 0$  Then the equations said to be:

Under damped

Over damped

Critically damped

None of them

Q: For the system of differential equations  $\frac{dy}{dt} = 2x, \frac{dx}{dt} = 3y$  the independent variable is **(Are)**

X,t

Y,t

X,y

t

Q: For the system of differential equations  $\frac{dy}{dt} = 2x, \frac{dx}{dt} = 3y$  the dependent variable is **(Are)**

X,t

Y,t

X,y

t



Q:  $\begin{pmatrix} 4-\lambda & 1 & 0 \\ 0 & 4-\lambda & 1 \\ 0 & 0 & 4-\lambda \end{pmatrix} = 0$  gives

$\lambda = 4$  of multiplicity of 1

$\lambda = 4$  of multiplicity of 2

$\lambda = 4$  of multiplicity of 3

None of the given.

Q: wronksin of x,  $x^2$  is

$x^2$

X