Tutorial – 3

Examples on Linear Differential Equation

Q. Solve the following

1)

$$\frac{dy}{dx} + P\,y = Q\,y^n$$

  A] Homogeneous D.E.
   B] Linear D.E. with constant coefficient
   C] Bernoulli's D.E.
   D] Exact D.E.

2)

$$\frac{1}{D}e^{ax} = ?$$

  A] ae^{ax} B] $\dfrac{e^{ax}}{x}$ C] $\dfrac{e^{ax}}{a}$ D] xe^{ax}

3)

  D.E. $\dfrac{dx}{dy} + P\,x = Q$ has integral factors as

    A] $e^{\int P dx}$ B] $e^{\int P/Q\,dx}$ C] $e^{\int P dY}$ D] $\dfrac{1}{mx+ny}$

4)

    $For\ D.E.\ f(D)y = 0, complete\ solution\ is$
     A] C.F.+P.I   B] P.I.   C] C.F.   D] P.I.- C.F

5)

  If $D^2(D^2 + 1)y = 0\ then\ roots\ of\ A.E.\ are$
   A] Only Real   B] Only Imaginary
   C] Real and Imaginary   C] Zero

6)

For $\frac{1}{f(D)} e^{ax} = \frac{1}{f(a)} e^{ax}$, *but if* $f(a) = 0$ *then*

    A] Integrate f(D)   B]Differentiate f(D)

    C]Replace D by a D] Replace a by D

7)

How many types of non-repeated roots A.E. has

    A] 0 B]1 C]2 D] 3

8)

If A.E. has $m_1 = 1 + i$, $m_2 = 1 - i$ *then C.F. is*

    A] $C_1 e^x + C_2 e^{-x}$ B] $e^x(cosx + sinx)$

    C] $e^x(C_1cosx - C_2sinx)$ D] $e^x(C_1cosx + sinx)$

9]

If C.F. for D.E. is y = $(C_1 + C_2) e^{-3x}$ +C_3 then roots of A.E. are

A] 3,3, C_3 B]0,3,3 C] 3,-3,0   D]0,-3,-3

10]

  C.F. = $e^x((C_1 + C_2x)cos\sqrt{2}x + (C_3 + C_4x)sin\sqrt{2}x)$

    then roots of A.E. are

    A] $1 \pm i\sqrt{2}$ B] $1 \pm i\, 2$

    C] $1 \pm i2, 1 \pm i2$ D] $1 \pm i\sqrt{2}, 1 \pm i\sqrt{2}$