Unit III MCQ – ODE – Answer Key

1

Solution of $(D^2 - 4)\ y = 0$ with $y(0) = 0$ and $y'(0) = 2$ is

A. cosh2x
B. sinh2x
C. e^{2x}
D. e^{-x}

Ans : B

2

Solution of $(D^2 - 7D + 12)\ y = 0$ is

A. $y = Ae^{-3x} + Be^{-4x}$
B. $y = Ae^{3x} + Be^{4x}$
C. $y = (A + Bx)e^{3x}$
D. $y = (A + Bx)e^{-4x}$

Ans : B

3

Particular integral of $(D - 9)^2\ y = e^{9x}\sin x$ is

A. $e^{9x}\cos x$
B. $-e^{9x}\cos x$
C. $e^{9x}\sin x$
D. $-e^{9x}\sin x$

Ans : D

4

Particular integral of $(D - 1)^2\ y = 2x$ is

A. $2x + 2$
B. $2x + 1$
C. $x + 4$
D. $2x + 4$

Ans : D

5

Which of the following is the general solution to $\frac{d^2y}{dx^2} + 3\frac{dy}{dx} + 2y = 0$

A. $y = Ae^{-x} + Be^{2x}$
B. $y = Ae^{-x} + Be^{-2x}$
C. $y = Ae^{x} + Be^{-2x}$
D. $y = Ae^{x} + Be^{2x}$

Ans : B

6

Solution of $(D^2 + 9)\, y = 0$ is

A. $y = A\cos 3x + B\sin 3x$
B. $y = A\cos x + B\sin x$
C. $y = Ae^{3x} + Be^{-3x}$
D. $y = (A + Bx)e^{3x}$

Ans : A

7

Particular integral of $(D^2 + 1)\, y = 2\sin x$ is

A. $\cos x$
B. $\sin x$
C. $-x\cos x$
D. $x\sin x$

Ans : C

8

Solution of $(D^2 + 6D + 9)\, y = 8$ is

A. $y = Ae^{2x} + Be^{2x} + 8/9$
B. $y = (A + Bx)e^{-3x} + 9/8$
C. $y = (A + Bx)e^{-3x} + 8/9$
D. $y = (A + Bx)e^{-3x}$

Ans : C

9

If $2 \pm 3i$ are roots of A.E of a differential equation f(D) = 0, then the general solution is

A. $y = e^{2x}(A\cos 3x + B\sin 3x)$
B. $y = A\cos 3x + B\sin 3x$
C. $y = Ae^{3x} + Be^{-3x}$
D. $y = e^{3x}(A\cos 2x + B\sin 2x)$

Ans : A

10

Particular integral of $(D^2 - 1)\, y = \sinh 2x$ is

A. $\frac{\sinh 2x}{2}$
B. $\frac{\sinh 2x}{3}$
C. $\frac{\sinh 2x}{4}$
D. $\frac{\sinh 2x}{5}$

Ans : B

11

Particular integral of $(D^2 - 2D - 8)\, y = e^{-2x}$ is

A. $\frac{-xe^{-2x}}{6}$
B. $\frac{xe^{-2x}}{6}$
C. $\frac{-xe^{-2x}}{2}$
D. $\frac{xe^{-2x}}{2}$

Ans : A

12

Solution of $(D^2 + 2bD + b^2)\, y = 0$ is

A. $y = Ae^{bx} + Be^{-bx}$
B. $y = Ae^{ax} + Be^{-bx}$
C. $y = (A + Bx)e^{bx}$
D. $y = (A + Bx)e^{-bx}$

Ans : D

13

Particular integral of $(D^2 + 10)\, y = \cos(3x + 2)$ is

A. $-\cos(3x + 2)$
B. $\cos(3x + 2)$
C. $\sin(3x + 2)$
D. $-\sin(3x + 2)$

Ans : B

14

Roots of auxiliary equation $m^2 - 2m + 1 = 0$ are

A. 2, 2
B. -2, -2
C. 1, 1
D. -1, 1

Ans : C

15

Particular integral of $(D - 3)^2 y = 3^x$ is

A. $\frac{3^x}{(\log 3 - 3)^2}$

B. $\frac{2^x}{(\log 3 - 3)^2}$

C. $\frac{3^x}{(\log 2 - 2)^2}$

D. $\frac{2^x}{(\log 2 - 2)^2}$

Ans : A

16

Value of $\frac{e^{ax}}{(D-a)^r}$ is

A. $\frac{e^{ax}}{r!}$

B. $\frac{x^r}{r!}$

C. $\frac{x^r e^{ax}}{r!}$

D. $\frac{x^a e^{ax}}{r!}$

Ans : C

17

Particular integral of $(D^2 + 1)\, y = \sin x$ is

A. $\frac{-x\sin x}{2}$

B. $\frac{-x\cos x}{2}$

C. $\frac{x\sin x}{2}$

D. $\frac{x\cos x}{2}$

Ans : B

18

Roots of A.E $m^2 + m + 1 = 0$ is

A. $1 \pm 3i$

B. $2 \pm i$

C. $\frac{-1}{2} \pm i\frac{\sqrt{3}}{2}$

D. $\frac{-1}{2} \pm i\frac{\sqrt{5}}{2}$

Ans : C

19

Solution of $(D^2 + 2D + 1)\, y = e^x$ is

A. $y = (A + Bx)e^{-x}$

B. $y = (A + Bx)e^{-x} + \frac{e^x}{4}$

C. $y = (A + Bx)e^{x}$

D. $y = (A + Bx)e^{x} + \frac{e^x}{4}$

Ans : B

20

Particular integral of $(D^2 + aD + b)\, y = d$ is

A. $\frac{b}{d}$

B. $\frac{-b}{d}$

C. $\frac{d}{b}$

D. $\frac{-d}{b}$

Ans : C