All Branches Hinglish

Subject: Engineering Mathematics

DPP-03

Chapter: Differential Equation

Topic : Solution of higher order linear DE

1. The solution of the differential equation $(x - y^2)$ $dx + 2xydy = 0$ is

(a) $ye^{2/x} = A$ (b) $xe^{y^2/x} = A$

(c) $xe^{x/y^2} = A$ (d) $ye^{x/y^2} = A$

2. The solution of the differential equation $2x\frac{dy}{dx} = 2 - y$ is

(a) $y = 2 - \sqrt{\frac{c}{x}}$ (b) $y = 2 + \sqrt{\frac{c}{x}}$

(c) $y = 2 - c\sqrt{x}$ (d) $y = 2 + c\sqrt{x}$

3. The general solution of the differential equation $\frac{dy}{dx} = \frac{y}{x} + \tan\frac{y}{x}$

(a) $\cos\frac{y}{x} = c$ (b) $\sin\frac{y}{x} = c$

(c) $\sin\frac{y}{x} = cx$ (d) $\cos\frac{y}{x} = cx$

4. The DE $xdy - ydx + 2x^3\,dx = 0$ has the solution

(a) $y + x^3 = c_1x$

(b) $-y + x^3 = c_2x$

(c) $y^3 - x^3 = c_4x$

(d) $y - x^3 = c_3x$

5. Solution of the *DE* $(2D + 1)^2\ y = 4e^{-\frac{x}{2}}$ is

(a) $y = (c_1 + c_2x)e^{-\frac{x}{2}}$

(b) $y = \left(c_1 + c_2x + \frac{1}{2}x^2\right)e^{-\frac{x}{2}}$

(c) $y = \left(c_1 + c_2x + \frac{1}{4}x^2\right)e^{-\frac{x}{2}}$

(d) None of these

6. The solution of the differential equation

$(D^2 + 1)^2\,y = 0,\ D = \frac{d}{dx}$, is

(a) $(A_1 + A_2x)\cos x + (A_3 + A_4x)\sin x$

(b) $e^x(A\cos x + B\sin x)$

(c) $(A_1 + A_2)\cos x + (A_3 + A_4)\sin x$

(d) $A\cos x + B\sin x$

7. The solution of the differential equation

$\frac{d^2y}{dx^2} - 3\frac{dy}{dx} + 2y = e^{3x}$ is given by

(a) $y = c_1e^x + c_2e^{2x} + \frac{1}{2}e^{3x}$

(b) $y = c_1e^{-x} + c_2e^{-2x} + \frac{1}{2}e^{3x}$

(c) $y = c_1e^{-x} + c_2e^{2x} + \frac{1}{2}e^{3x}$

(d) $y = c_1e^x + \frac{1}{2}e^{-3x}$

8. The particular integral of the differential equation $\left(D^3 - D\right)y = e^x + e^{-x}, D = \frac{d}{dx}$ is

(a) $\frac{1}{2}\left(e^x + e^{-x}\right)$

(b) $\frac{1}{2}x\left(e^x + e^{-x}\right)$

(c) $\frac{1}{2}x^2\left(e^x + e^{-x}\right)$

(d) $\frac{1}{2}x^2\left(e^x - e^{-x}\right)$

9. The particular integral for the differential equation $\frac{d^3y}{dx^3}-\frac{d^2y}{dx^2}-6\frac{dy}{dx}=1+x^2$ is given by

(a) $\frac{1}{9}x^3+\frac{1}{4}x^2=\frac{25}{12}x$

(b) $-\frac{x^3}{18}+\frac{x^2}{36}-\frac{25}{108}x$

(c) $x^3-\frac{1}{2}x^2-\frac{25}{9}x$

(d) $\frac{1}{3}x^2+\frac{1}{12}x^2-\frac{25}{36}x$

10. The solution of the differential equation $xdy - ydx = \sqrt{x^2+y^2}\,dx$ is given by

(a) $y=\frac{c_1}{x}+\sqrt{x^2-y^2}$

(b) $y=c_2x^2-\sqrt{x^2+y^2}$

(c) $y=\frac{c_3}{x^2}+\frac{1}{\sqrt{x^2+y^2}}$

(d) $y=\frac{c_4}{x}-\frac{1}{\sqrt{x^2-y^2}}$

Answer Key

1. **(b)**
2. **(a)**
3. **(c)**
4. **(a)**
5. **(b)**
6. **(a)**
7. **(a)**
8. **(b)**
9. **(b)**
10. **(b)**