DIFFERENTIAL EQUATION

1. The solution of the DE $\frac{dy}{dx} = e^{x+y}$ is

(a) e $e^x + e^y = C$ (b) $e^x + e^{-y} = C$ (c) $e^x + e^{-y} = C$ (d) none of these

2. The solution of the DE $\frac{dy}{dx} = 2^{x+y}$ is

(a) $2^x + 2^y = C$ (b) $2^x + 2^{-y} = C$ (c) $2^x + 2^{-y} = C$ (d) none of these

3. The solution of the DE $e^x + 1)\ ydy = (y+1)e^x\, dx$ is

(a) $e^y - C(e^x + 1)(y+1)$ (b) $e^y = e^x + y + 1$

(c) $y = (e^x + 1)(y+1)$ (d) none of these

4. The solution of the DE $xdy + ydx = 0$ is

(a) $x + y = C$ (b) $xy = C$ (c) $\log(x+y) = C$ (d) none of these

5. The solution of the DE $x\frac{dy}{dx} = \cot y$ is

(a) $x\cos y = C$ (b) $x\tan\ y = C$ (c) $x\ \sec\ y = C$ (d) none of these

6. The solution of the DE $\frac{dy}{dx} = \frac{(1+y^2)}{(1+x^2)}$ is

(a) $(y+x) = C(1-y^x)$ (b) $(y-x) = C(1+y^x)$

(c) $y = (1+x)C$ (d) none of these

7. The solution of the DE $\frac{dy}{dx} = 1 - x + y - xy$ is

(a) $\log(1+y) = x - \frac{x^2}{2} + C$ (b) $e^{(1+y)} = x - \frac{x^2}{2} + C$

(c) $e^y = x - \frac{x^2}{2} + C$ (d) none of these

8. The solution of the DE $\frac{dy}{dx} = e^{x+y} + x^2 e^y$ is

(a) $e^{x-y} + \frac{x^3}{3} + C$ (b) $e^x + e^{-y} + \frac{x^3}{3} = C'$

(c) $e^x - e^{-y} = \frac{x^3}{3} + C$ (d) none of these

9. The solution of the DE $\frac{dy}{dx} + \sqrt{\frac{1-y^2}{1-x^2}} = 0$ is

(a) $y + \sin^{-1} y = \sin^{-1} x + C$ (b) $\sin^{-1} y - \sin^{-1} x = C$

(c) $\sin^{-1} y + \sin^{-1} x + C$ (d) none of these

10. The solution of the DE $\frac{dy}{dx} = \frac{1-\cos x}{1+\cos x}$ is

(a) $y = 2\tan\frac{x}{2} - x + C$ (b) $y = \tan\frac{x}{2} - 2x + C$

(c) $y = \tan x - x + C$ (d) none of these

11. The solution of the DE $\frac{dy}{dx} = \frac{-2xy}{(x^2+1)}$ is

(a) $y^2(x+1) = C$ (b) $y(x^2+1) = C$ (c) $x^2(y+1) = C$ (d) none of these

12. The solution of the DE $\cos x(1+\cos y)dx - \sin y(1+\sin x)dy = 0$ is

(a) $1 + \sin x \cos y = C$ (b) $(1 + \sin x)(1+\cos y) = C$

(c) $\sin x \cos y + \cos x = C$ (d) none of these

13. The solution of the DE $x \cos y dy = (xe^x \log x + e^x)dx$ is

(a) $\sin y = e^x + \log x + C$ (b) $\sin y - e^x + \log x = C$

(c) $\sin y = e^x(\log x) + C$ (d) none of these

14. The solution of the DE $\frac{dy}{dx} + y \log y \cot x = 0$ is

(a) $\cos x \log y = C$ (b) $\sin x \log y = C$

(c) $\log y = C \sin x$ (d) none of these

15. The general solution of the DE $(1+x^2)dy - xydx = 0$ is

(a) $y = C(1+x^2)$ (b) $y^2 = C(1+x^2)$ (c) $\log y = C \sin x$ (d) none of these

16. The general solution of the DE $x\sqrt{1+y^2}\,dx + y\sqrt{1+x^2}\,dy = 0$ is

(a) $\sin^{-1} x + \sin^{-1} y = C$ (b) $\sqrt{1+x^2} + \sqrt{1+y^2} = C$

(c) $\tan^{-1} x + \tan^{-y} = C$ (d) none of these

17. The **general solution of the DE** $\log \frac{dy}{dx} = (ax + by)$ **is**

(a) $\frac{-e^{-by}}{b} = \frac{e^{ax}}{a} + C$ (b) $e^{ax} - e^{-by} = C$

(c) $be^{ax} + ae^{by} = C$ (d) none of these

18. The general solution of the DE $\frac{dy}{dx} = (\sqrt{1-x^2})(\sqrt{1-y^2})$ is

(a) $\sin^{-1} y \sin^{-1} x = x\sqrt{1-x^2} = C$ (b) $2\sin^{-1} y - \sin^{-1} x = x\sqrt{1-x^2} + C$

(c) $2\sin^{-1} y - \sin^{-1} x = C$ (d) none of these

19. The general solution of the DE $\frac{dy}{dx} = \frac{y^2 - x^2}{2xy}$ is

(a) $x^2 - y^2 = C_1 x$ (b) $x^2 + y^2 = C_1 y$

(c) $x^2 + y^2 = C_1 x$ (d) none of these

20. The general solution of the DE $x^2 \frac{dy}{dx} = x^2 + xy + y^2$ is

(a) $\tan^{-1}\frac{y}{x}=\log x+C$ (b) $\tan^{-1}\frac{x}{y}=\log x+C$

(c) $\tan^{-1}\frac{y}{x}=\log y+C$ (d) none of these

21. The general solution of the DE $x\frac{dy}{dx}=y+x\tan\frac{y}{x}$ is

(a) $\sin\frac{y}{x}=c$ (b) $\sin\left(\frac{y}{x}\right)=Cx$ (c) $\sin\left(\frac{y}{x}\right)=Cy$ (d) none of these

22. The general solution of the DE $2xy\,dy+(x^2-y^2)dx=0$ is

(a) $x^2+y^2=Cx$ (b) $x^2+y^2=Cy$ (c) $x^2+y^2=C$ (d) none of these

23. The general solution of the DE $(x-y)dy+(x+y)dx$ is

(a) $\tan^{-1}\frac{y}{x}=C\sqrt{x^2+y^2}$ (b) $e^{\tan^{-1}(y/x)}=C\sqrt{x^2+y^2}$

(c) $\tan^{-1}\left(\frac{y}{x}\right)=x^2+y^2+C$ (d) none of these

24. The general solution of the DE $\frac{dy}{dx}=\frac{y}{x}+\sin\frac{y}{x}$ is

(a) $\tan\frac{y}{2x}=Cx$ (b) $\tan\frac{y}{x}=Cx$ (c) $\tan\frac{y}{2x}=C$ (d) none of these

25. The general solution of the DE $\frac{dy}{dx}+y\tan x=\sec x$ is

(a) $y=\sin x-C\cos x$ (b) $y=\sin x+C\cos x$

(c) $y=\cos x-C\sin x$ (d) none of these

26. The general solution of the DE $\frac{dy}{dx}+y\cot x=2\cos x$ is

(a) $(y+\sin x)\sin x=C$ (b) $(y+\cos x)\sin x=C$

(c) $(y-\sin x)\sin x = C$ (d) none of these

27. The general solution of the DE $\frac{dy}{dx}+\frac{y}{x}=x^2$ is

(a) $xy = x^4 + C$ (b) $4xy = x^4 + C$ (c) $3xy = x^3 + C$ (d) none of these

28. The number of arbitrary constants in the general solutions of a differential equation $\frac{dy}{dx}+\frac{y}{x}=x^2$

(a) 1 (b) 2 (c) 3 (d) 4

29. The number of arbitrary constants in the general solutions of a differential equation $2\frac{d^2y}{dx^2}+\left(\frac{dy}{dx}\right)^3=0$

(a) 1 (b) 2 (c) 3 (d) 4

30. The number of arbitrary constants in the general solutions of a differential equation $\left(\frac{d^3y}{dx^3}\right)+x^2\left(\frac{d^2y}{dx^2}\right)^3=0$

(a) 1 (b) 2 (c) 3 (d) 4

31. The number of arbitrary constants in the particular solutions of a differential equation $\frac{dy}{dx}+\frac{y}{x}=x^2$

(a) 1 (b) 0 (c) 3 (d) 4

32. The number of arbitrary constants in the particular solutions of a differential equation $2\frac{d^2y}{dx^2}+\left(\frac{dy}{dx}\right)^3=0$

(a) 1 (b) 2 (c) 3 (d) 0

33. The number of arbitrary constants in the particular solutions of a differential equation $\left(\frac{d^3y}{dx^3}\right)+x^2\left(\frac{d^2y}{dx^2}\right)^3=0$

(a) 1 (b) 2 (c) 0 (d) 4

ANSWERS :DIFFERENTIAL EQUATION

1. (c)	2. (b)	3. (a)	4. (b)	5. (a)	6. (b)	7. (a)	8. (b)	9. (c)
10.(a)	11.(b)	12. (b)	13. (c)	14. (b)	15. (b)	16. (b)	17. (a)	18. (b)
19.(c)	20.(a)	21. (b)	22. (a)	23. (b)	24. (a)	25. (b)	26. (c)	27. (b)
28 (a)	29(b)	30(c)		31(b)	32(d)	33(c)		

Find the order and degree of the following differential equations

1. $2\frac{d^2y}{dx^2}+\left(\frac{dy}{dx}\right)^3=0$

   (a) 1, 2 (b) 2,1 (c) 1, 3 (d) 0, 0

2. $\left(\frac{d^3y}{dx^3}\right)+x^2\left(\frac{d^2y}{dx^2}\right)^3=0$

   (a) 1, 3 (b) 3,1 (c) 2, 3 (d) 3, 3

3. $\left(\frac{d^3y}{dx^3}\right)+2\left(\frac{d^2y}{dx^2}\right)^2-\frac{dy}{dx}+y=0$

   (a) 1, 3 (b) 3,1 (c) 2, 1 (d) 3, 2

4. $\left(\frac{dy}{dx}\right)^2+\left(\frac{dy}{dx}\right)-\sin^2 y=0$

   (a) 1, 2 (b) 1,1 (c) 2, 1 (d) 3, 2

5. $\frac{dy}{dx}+\sin\left(\frac{dy}{dx}\right)=0$

   (a) 1, 1 (b) 2,1 (c) 1, 2 (d) None of these

ANSWERS

1. b 2. b 3. B 4. a 5. D