DPP
DAILY PRACTICE PROBLEMS

CLASS : XIIth **SUBJECT : MATHS**
DATE : **DPP NO. : 8**

Topic :-DIFFERENTIAL EQUATIONS

1. The equation of the curve in which subnormal varies as the square of the ordinate is (λ is constant of proportionality)

a) $y = C\,e^{2\lambda x}$ b) $y = C\,e^{\lambda x}$ c) $\frac{y^2}{2} + \lambda x = C$ d) $y^2 + \lambda x^2 = C$

2. The general solution of the differential equation $\frac{dy}{dx} + \frac{1+\cos 2y}{1-\cos 2x} = 0$ is given by

a) $\tan y + \cot x = c$ b) $\tan y - \cot x = c$ c) $\tan x - \cot y = c$ d) $\tan x + \cot y = c$

3. The solution of the differential equation $\left(e^{-2\sqrt{x}} - \frac{y}{\sqrt{x}}\right)\frac{dy}{dx} = 1$ is given by

a) $ye^{2\sqrt{x}} = x + c$ b) $ye^{-2\sqrt{x}} = \sqrt{x} + c$ c) $y = \sqrt{x}$ d) $y = 3\sqrt{x}$

4. The solution of the differential equation $e^{-x}(y+1)dy + (\cos^2 x - \sin 2x)y\,dx = 0$ subjected to the condition that $y = 1$ when $x = 0$ is

a) $y + \log y + e^x \cos^2 x = 2$ b) $\log(y+1) + e^x \cos^2 x = 1$
c) $y + \log y = e^x \cos^2 x$ d) $(y+1) + e^x \cos^2 x = 2$

5. The solution of the differential equation $\frac{dy}{dx} = (4x + y + 1)^2$, is

a) $(4x + y + 1) = \tan(2x + c)$ b) $(4x + y + 1)^2 = 2\tan(2x + c)$
c) $(4x + y + 1)^3 = 3\tan(2x + c)$ d) $(4x + y + 1) = 2\tan(2x + c)$

6. An integrating factor of the differential equation
$x + \frac{dy}{dx} + y\log x = xe^x x^{-\frac{1}{2}\log x}$, $(x,0)$is

a) $x^{\log x}$ b) $(\sqrt{x})^{\log x}$ c) $(\sqrt{e})^{(\log x)^2}$ d) e^{x^2}

7. The order of differential equation of all parabola with it's axis parallel to y-axis and touch x-axis is

a) 2 b) 3 c) 1 d) None of these

8. The differential equation obtained on eliminating A and B from the equation $y = A\cos \omega t + B \sin \omega t$ is

a) $y_2 = -\omega^2 y$ b) $y_1 + y = 0$ c) $y_2 + y_1 = 0$ d) $y_1 - \omega^2 y = 0$

9. The solution of the differential equation $\frac{dy}{dx}\tan y = \sin(x+y) + \sin(x-y)$ is

a) $\sec y + 2\cos x = c$ b) $\sec y - 2\cos x = c$ c) $\cos y - 2\sin x = c$ d) $\tan y - 2\sec y = c$

10. The degree of the differential equation satisfying the relation $\sqrt{1+x^2} + \sqrt{1+y^2} = \lambda\left(x\sqrt{1+y^2} - y\sqrt{1+x^2}\right)$, is

a) 1 b) 2 c) 3 d) None of these

11. The solution of the differential equation $\frac{dy}{dx} - y\tan x = e^x \sec x$ is

a) $y = e^x \cos x + c$ b) $y\cos x = e^x + c$ c) $y = e^x \sin x + c$ d) $y\sin x = e^x + c$

12. The degree of the differential equations $x = 1 + \left(\frac{dy}{dx}\right) + \frac{1}{2!}\left(\frac{dy}{dx}\right)^2 + \frac{1}{3!}\left(\frac{dy}{dx}\right)^3 + \ldots$

a) 3 b) 2 c) 1 d) Not defined

13. If $y = y(x)$ and $\frac{2+\sin x}{y+1}\left(\frac{dy}{dx}\right) = -\cos x$, $y(0) = 1$, then $y\left(\frac{\pi}{2}\right)$ equals

a) $\frac{1}{3}$ b) $\frac{2}{3}$ c) $-\frac{1}{3}$ d) 1

14. The solution of $\cos y \frac{dy}{dx} = e^{x+\sin y} + x^2 e^{\sin y}$ is

a) $e^x - e^{\sin y} + \frac{x^3}{3} = c$ b) $e^{-x} - e^{-\sin y} + \frac{x^3}{3} = c$

c) $e^x + e^{-\sin y} + \frac{x^3}{3} = c$ d) $e^x - e^{\sin y} - \frac{x^3}{3} = c$

15. The solution of $y\,dx - x\,dy + 3x^2y^2e^{x^3}dx = 0$ is

a) $\frac{x}{y} + e^{x^3} = C$ b) $\frac{x}{y} - e^{x^3} = 0$ c) $-\frac{x}{y} + e^{x^3} = C$ d) None of these

16. The general solution of $\frac{dy}{dx} = \frac{2x-y}{x+2y}$ is

a) $x^2 - xy + y^2 = c$ b) $x^2 - xy - y^2 = c$ c) $x^2 + xy - y^2 = c$ d) $x^2 + xy^2 = c$

17. $y + x^2 = \frac{dy}{dx}$ has the solution

a) $y + x^2 + 2x + 2 = ce^x$ b) $y + x + x^2 + 2 = ce^{2x}$

c) $y + x + 2x^2 + 2 = ce^x$ d) $y^2 + x + x^2 + 2 = ce^x$

18. The equation of curve passing through the point $\left(1, \frac{\pi}{4}\right)$ and having slope of tangent at any point (x,y) as $\frac{y}{x} - \cos^2\left(\frac{y}{x}\right)$, is

a) $x = e^{1+\tan\left(\frac{y}{x}\right)}$ b) $x = e^{1-\tan\left(\frac{y}{x}\right)}$ c) $x = e^{1+\tan\left(\frac{x}{y}\right)}$ d) $x = e^{1-\tan\left(\frac{x}{y}\right)}$

19. The solution of $\frac{dy}{dx} = 1 + y + y^2 + x + xy + xy^2$ is

a) $\tan^{-1}\left(\frac{2y+1}{\sqrt{3}}\right) = x + x^2 + c$

b) $4\tan^{-1}\left(\frac{4y+1}{\sqrt{3}}\right) = \sqrt{3}(2x + x^2) + c$

c) $\sqrt{3}\tan^{-1}\left(\frac{3y+1}{3}\right) = 4\left(1 + x + x^2\right) + c$

d) $4\tan^{-1}\left(\frac{2y+1}{\sqrt{3}}\right) = \sqrt{3}(2x + x^2) + c$

20. The solution of $\frac{dy}{dx} = 2^{y-x}$ is

a) $2^x + 2^y = c$

b) $2^x - 2^y = c$

c) $\frac{1}{2^x} - \frac{1}{2^y} = c$

d) $\frac{1}{2^x} + \frac{1}{2^y} = c$