DPP
DAILY PRACTICE PROBLEMS

CLASS : XIIth **SUBJECT : MATHS**
DATE : **DPP NO. : 3**

Topic :-DIFFERENTIAL EQUATIONS

1. Solution of the differential equation $\frac{dy}{dx}+y\sec^2 x=\tan x\sec^2 x$ is
a) $y=\tan x-1+ce^{-\tan x}$
b) $y^2=\tan x-1+ce^{\tan x}$
c) $ye^{\tan x}=\tan x-1+c$
d) $ye^{-\tan x}=\tan x-1+c$

2. The differential equation $y\frac{dy}{dx}+x=a$ (a is any constant) represents
a) A set of circles having centre on the y −axis
b) A set of circles on the x −axis
c) A set of ellipses
d) None of these

3. The equation of the curve for which the square of the ordinate is twice the rectangle contained by the abscissa and the intercept of the normal on x-axis and passing through (2, 1) is
a) $x^2+y^2-x=0$
b) $4x^2+2y^2-9y=0$
c) $2x^2+4y^2-9x=0$
d) $4x^2+2y^2-9x=0$

4. The general solution of $ydx-xdy-3x^2y^2e^{x^3}dx=0$, is equal to
a) $\frac{x}{y}=e^{x^3}+C$
b) $\frac{y}{x}=e^{x^3}+C$
c) $xy=e^{x^3}+C$
d) $xy=e^x+C$

5. The solution of $\frac{dy}{dx}=\frac{ax+h}{by+k}$ represents a parabola, when
a) $a=0, b=0$
b) $a=1, b=2$
c) $a=0, b\neq 0$
d) $a=2,\ b=1$

6. The differential equation of all ellipses centred at the origin is
a) $y_2+x\,y_1^2-y\,y_1=0$
b) $xy\,y_2+x\,y_1^2-y\,y_1=0$
c) $y\,y_2+x\,y_1^2-x\,y_1=0$
d) None of these

7. If $y=ax^{n+1}$, then $x^2\frac{d^2y}{dx^2}$ is equal to
a) $n(n-1)$
b) $n(n+1)y$
c) ny
d) n^2y

8. The differential equation of the family of curves $y=a\cos(x+b)$ is
a) $\frac{d^2y}{dx^2}-y=0$
b) $\frac{d^2y}{dx^2}+y=0$
c) $\frac{d^2y}{dx^2}+2y=0$
d) None of these

9. If $y(t)$ is a solution of $(1+t)\frac{dy}{dt}-ty=1$ and $y(0)=-1$, then $y(1)$ is equal to
a) $-\frac{1}{2}$
b) $e+\left(\frac{1}{2}\right)$
c) $e-\frac{1}{2}$
d) $\frac{1}{2}$

10. The integrating factor of the differential equation $\frac{dy}{dx}+\frac{y}{(1-x)\sqrt{x}}=1-\sqrt{x}$ is

a) $\frac{1-\sqrt{x}}{1+\sqrt{x}}$ b) $\frac{1+\sqrt{x}}{1-\sqrt{x}}$ c) $\frac{1-x}{1+x}$ d) $\frac{\sqrt{x}}{1-\sqrt{x}}$

11. The solution of the differential equation $(x^2+y^2)dx=2xy\,dy$ is (here c is an arbitrary constant)

a) $x^2+y^2=cy$ b) $c(x^2-y^2)=x$ c) $x^2-y^2=cy$ d) $x^2+y^2=cx$

12. The real value of n for which the substitution $y=u^n$ will transform the differential equation $2x^4y\frac{dy}{dx}+y^4=4x^6$ into a homogenous equation is

a) $1/2$ b) 1 c) $3/2$ d) 2

13. The differential equation satisfied by the family of curves $y=ax\cos\left(\frac{1}{x}+b\right)$ where a,b are parameters is

a) $x^2y_2+y=0$ b) $x^4y_2+y=0$ c) $xy_2-y=0$ d) $x^4y_2-y=0$

14. The solution of the differential equation $\frac{dy}{dx}=x\log x$ is

a) $y=x^2\log x-\frac{x^2}{2}+c$ b) $y=\frac{x^2}{2}\log x-\frac{x^2}{4}+c$

c) $y=\frac{x^2}{2}+\frac{x^2}{2}\log x+c$ d) None of these

15. Differential equation of $y=\sec(\tan^{-1}x)$ is

a) $(1+x^2)\frac{dy}{dx}=y+x$ b) $(1+x^2)\frac{dy}{dx}=y-x$ c) $(1+x^2)\frac{dy}{dx}=xy$ d) $(1+x^2)\frac{dy}{dx}=\frac{x}{y}$

16. 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) $\tan y-2\sec x=c$

17. The differential equation of the family of parabolas with focus at the origin and the x-axis as axis, is

a) $y\left(\frac{dy}{dx}\right)^2+4x\frac{dy}{dx}=4y$ b) $-y\left(\frac{dy}{dx}\right)^2=2x\frac{dy}{dx}-y$

c) $y\left(\frac{dy}{dx}\right)^2+y=2xy\frac{dy}{dx}$ d) $y\left(\frac{dy}{dx}\right)^2+2xy\frac{dy}{dx}+y=0$

18. The integrating factor of the differential equation $\frac{dy}{dx}+y=\frac{1+y}{x}$, is

a) $\frac{x}{e^x}$ b) $\frac{e^x}{x}$ c) $x\,e^x$ d) e^x

19. The differential equation of all coaxial parabola $y^2=4a(x-b)$, where a and b are arbitrary constants, is

a) $y\frac{d^2y}{dx^2}+\frac{dy}{dx}=1$ b) $y\frac{d^2y}{dx^2}+\left(\frac{dy}{dx}\right)^2=1$ c) $y\frac{d^2y}{dx^2}+\left(\frac{dy}{dx}\right)^2=0$ d) $y\frac{d^2y}{dx^2}+\frac{dy}{dx}=0$

20. If $\frac{d^2y}{dx^2}\sin x=0$, then the solution of differential equation is

a) $y=\sin x+cx+d$ b) $y=\cos x+cx^2+d$ c) $y=\tan x+c$ d) $y=\log\sin x+cx$