DPP
DAILY PRACTICE PROBLEMS

CLASS : XIIth **SUBJECT : MATHS**
DATE : **DPP NO. : 4**

Topic :-DIFFERENTIAL EQUATIONS

1. The solution of $\frac{dy}{dx}+y=e^{-x}, y(0)=0$ is
   a) $y=e^{-x}(x-1)$ b) $y=xe^{x}$ c) $y=xe^{-x}+1$ d) $y=xe^{-x}$

2. A curve having the condition that the slope of tangent at some point is two times the slope of the straight line joining the same point to the origin of coordinates, is a/an
   a) Circle b) Ellipse c) Parabola d) Hyperbola

3. The solution of the differential equation $x\frac{dy}{dx}+2y=x^2$ is
   a) $y=\frac{x^2+c}{4x^2}$ b) $y=\frac{x^2}{4}+c$ c) $y=\frac{x^4+c}{x^2}$ d) $y=\frac{x^4+c}{4x^2}$

4. The solution of the differential equation $y\frac{dy}{dx}=x-1$ satisfying $y(1)=1$ is
   a) $y^2=x^2-2x+2$ b) $y^2=2x^2-x-1$ c) $y=x^2-2x+2$ d) None of these

5. The differential equation of the family of lines whose slope is equal to y-intercept, is
   a) $(x+1)\frac{dy}{dx}-y=0$ b) $(x+1)\frac{dy}{dx}+y=0$
   c) $\frac{dy}{dx}=\frac{x-1}{y-1}$ d) $\frac{dy}{dx}=\frac{x+1}{y+1}$

6. Solution of the equation $x^2y-x^3\frac{dy}{dx}=y^4\cos x$, when $y(0)=1$ is
   a) $y^3=3x^3\sin x$ b) $x^3=3y^3\sin x$ c) $x^3=y^3\sin x$ d) $x^3=y^3\cos x$

7. A curve $y=f(x)$ passes through the point $P(1,1)$. The normal to the curve at point $P$is a $(y-1)+(x-1)=0$. If the slope of the tangent at any point on the curve is proportional to the ordinate at that point, then the equation of the curve is
   a) $y=e^{ax}-1$ b) $y=e^{ax}+1$ c) $y=e^{ax}-a$ d) $y=e^{a(x-1)}$

8. The solution of $\frac{dy}{dx}+1=e^{x+y}$ is
   a) $e^{-(x+y)}+x+c=0$ b) $e^{-(x+y)}-x+c=0$ c) $e^{x+y}+x+c=0$ d) $e^{x+y}-x+c=0$

9. The solution of the differential equation $\left\{\frac{1}{x}-\frac{y^2}{(x-y)^2}\right\}dx+\left\{\frac{x^2}{(x-y)^2}-\frac{1}{y}\right\}dy=0$ is

a) $\text{In}\left|\frac{x}{y}\right|+\frac{xy}{(x-y)}=c$ b) $\text{In}\,|xy|+\frac{xy}{(x-y)}=c$ c) $\frac{xy}{(x-y)}=ce^{x/y}$

d) $\frac{xy}{(x-y)}=ce^{xy}$

(where c is arbitrary constant)

10. Degree of differential equation $e^{dy/dx}=x$ is

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

11. The order and degree of the differential equation $\left(1+\left(\frac{dy}{dx}\right)^2\right)^{3/4}=\left(\frac{d^2y}{dx^2}\right)^{1/3}$ is

a) (2,4) b) (2,3) c) (6,4) d) (6,9)

12. $\tan^{-1}x+\tan^{-1}y=C$ is the general solution of the differential equation

a) $\frac{dy}{dx}=\frac{1+y^2}{1+x^2}$

b) $\frac{dy}{dx}=\frac{1+x^2}{1+y^2}$

c) $(1+x^2)dy+(1+y^2)dx=0$

d) $\frac{dy}{dx}=\frac{1-y^2}{1-x^2}$

13. The solution of $y'=1+x+y^2+xy^2$, $y(0)=0$ is

a) $y^2=\exp\left(x+\frac{x^2}{2}\right)-1$ b) $y^2=1+c\exp\left(x+\frac{x^2}{2}\right)$

c) $y=\tan(c+x+x^2)$ d) $y=\tan\left(x+\frac{x^2}{2}\right)$

14. If $\frac{dy}{dx}=e^{-2y}$ and $y=0$ when $x=5$, the value of x and $y=3$ is

a) e^5 b) e^6+1 c) $\frac{e^6+9}{2}$ d) $\log_e 6$

15. The solution of differential equation $(\sin x+\cos x)dy+(\cos x-\sin x)dx=0$ is

a) $e^x(\sin x+\cos x)+c=0$ b) $e^y(\sin x+\cos x)=c$

c) $e^y(\cos x-\sin x)=c$ d) $e^x(\sin x-\cos x+x)=c$

16. If $x\ dy=y(dx+y\ dy)$, $y(1)=1$ and $y(x)>0$, then $y(-3)$ is equal to

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

17. The solution of the differential equation $\frac{dy}{dx}=\frac{y}{x}+\frac{\phi\left(\frac{y}{x}\right)}{\phi'\left(\frac{y}{x}\right)}$ is

a) $\phi\left(\frac{y}{x}\right)=kx$ b) $x\phi\left(\frac{y}{x}\right)=k$ c) $\phi\left(\frac{y}{x}\right)=ky$ d) $y\phi\left(\frac{y}{x}\right)=k$

18. The solution of $(x+y+1)\frac{dy}{dx}=1$ is

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

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

19. The differential equation of the family of the curves $x^2 + y^2 - 2ax = 0$ is

a) $x^2 - y^2 - 2xy'' = 0$ b) $y^2 - x^2 = 2xyy'$

c) $x^2 + y^2 + 2y'' = 0$ d) None of these

20. If c_1, c_2, c_3, c_4, c_5 and c_6 are constants, then the order of the differential equation whose general solution is given by

$y = c_1\cos(x + c_2) + c_3\sin(x + c_4) + c_5e^x + c_6$ is

a) 6 b) 5 c) 4 d) 3