DPP
DAILY PRACTICE PROBLEMS

**CLASS : XIIth** **SUBJECT : MATHS**
**DATE :** **DPP NO. : 7**

# Topic :-DIFFERENTIAL EQUATIONS

1. The function $f(\theta)=\frac{d}{d\theta}\int_0^{\theta}\frac{dx}{1-\cos\theta\cos x}$ satisfies the differential equation

   a) $\frac{df}{d\theta}+2f(\theta)=0$ b) $\frac{df}{d\theta}-2f(\theta)=0$ c) $\frac{df}{d\theta}-2f(\theta)=\tan\theta$

   d) $\frac{df}{d\theta}+2f(\theta)\cot\theta=0$

2. The solution of $\frac{dy}{dx}=\left(\frac{y}{x}\right)^{1/3}$, is

   a) $x^{2/3}+y^{2/3}=C$ b) $x^{1/3}+y^{1/3}=C$ c) $y^{2/3}-x^{2/3}=C$ d) $y^{1/3}-x^{1/3}=C$

3. If $x\sin\left(\frac{y}{x}\right)dy=\left[y\sin\left(\frac{y}{x}\right)-y\right]dx$ and $y(1)=\frac{\pi}{2}$, then the value of $\cos\left(\frac{y}{x}\right)$ is equal to

   a) $x$ b) $\frac{1}{x}$ c) $\log x$ d) $e^x$

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

5. If $\frac{dy}{dx}=\frac{xy}{x^2+y^2}$, $y(1)=1$, then one of the values of $x_0$ satisfying $y(x_0)=e$ is given by

   a) $e\sqrt{2}$ b) $e\sqrt{3}$ c) $e\sqrt{5}$ d) $e/\sqrt{2}$

6. Solution of $\frac{dy}{dx}=3^{x+y}$ is

   a) $3^{x+y}=c$ b) $3^x+3^y=c$ c) $3^{x-y}=c$ d) $3^x+3^{-y}=c$

7. Order of the differential equation of the family of all concentric circles centred at $(h,k)$ is

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

8. The solution of $\frac{dy}{dx}=\cos(x+y)+\sin(x+y)$ is

   a) $\log\left[1+\tan\left(\frac{x+y}{2}\right)\right]+c=0$ b) $\log\left[1+\tan\left(\frac{x+y}{2}\right)\right]=x+c$

   c) $\log\left[1-\tan\left(\frac{x+y}{2}\right)\right]=x+c$ d) None of these

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

a) $(1+x^2)(1+y^2)=c$ b) $(1+x^2)(1+y^2)=cx^2$
c) $(1-x^2)(1-y^2)=c$ d) $(1+x^2)(1+y^2)=cy^2$

10. 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) $x^2+xy^2=c$

11. The differential equation representing the family of curves $y^2=2c(x+c^{2/3})$, where $c$ is a positive parameter, is of
a) Order 3, degree 3 b) Order 2, degree 4 c) Order 1, degree 5 d) Order 5, degree 1

12. The solution of the differential equation $\frac{dx}{x}+\frac{dy}{y}=0$ is
a) $xy=c$ b) $x+y=c$ c) $\log x \log y=c$ d) $x^2+y^2=c$

13. If $y=(x+\sqrt{1+x})^n$, then $(1+x^2)\frac{d^2y}{dx^2}+x\frac{dy}{dx}$ is
a) $n^2y$ b) $-n^2y$ c) $-y$ d) $2x^2y$

14. The order of the differential equation whose general solution is given by $y=(c_1+c_2)\cos(x+c_3)-c_4e^{x+c_5}$ where $c_1,c_2,c_3,c_4$ and $c_5$ are arbitrary constants is
a) 5 b) 6 c) 3 d) 2

15. The differential equation obtained by eliminating arbitrary constants from $y=ae^{bx}$ is
a) $y\frac{d^2y}{dx^2}+\frac{dy}{dx}=0$ b) $y\frac{d^2y}{dx^2}-\frac{dy}{dx}=0$ c) $y\frac{d^2y}{dx^2}-\left(\frac{dy}{dx}\right)^2=0$ d) $y\frac{d^2y}{dx^2}+\left(\frac{dy}{dx}\right)^2=0$

16. The differential equation of all non-horizontal lines in a plane is
a) $\frac{d^2y}{dx^2}=0$ b) $\frac{dx}{dy}=0$ c) $\frac{dy}{dx}=0$ d) $\frac{d^2x}{dy^2}=0$

17. The degree of the differential equation satisfying $\sqrt{1-x^2}+\sqrt{1-y^2}=a(x-y)$ is
a) 1 b) 2 c) 3 d) None of these

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

19. The integrating factor of the differential equation $\frac{dy}{dx}+\frac{1}{x}.y=3x$ is
a) $x$ b) $\ln x$ c) 0 d) $\infty$

20. The solution of the differential equation $\sec^2 x\tan y\,dx+\sec^2 y\tan x\,dy=0$ is
a) $\tan y\tan x=c$ b) $\frac{\tan y}{\tan x}=c$ c) $\frac{\tan^2 x}{\tan y}=c$ d) None of these