DPP
DAILY PRACTICE PROBLEMS

CLASS : XIIth **SUBJECT : MATHS**
DATE : **DPP NO. : 5**

Topic :-DIFFERENTIAL EQUATIONS

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

a) $\frac{y}{4}+\frac{1}{x^2+y^2}=c$ b) $\frac{y}{x}-\frac{1}{x^2+y^2}=c$ c) $\frac{x}{y}-\frac{1}{x^2+y^2}=c$ d) None of these

2. The solution of differential equation $(1+x)y\,dx+(1-y)x\,dy=0$ is

a) $\log_e(xy)+x-y=c$ b) $\log_e\left(\frac{x}{y}\right)+x+y=c$

c) $\log_e\left(\frac{x}{y}\right)-x+y=c$ d) $\log_e(xy)-x+y=c$

3. The differential equation representing the family of curves $y^2=2c(x+\sqrt{c})$, where $c>0$ is a parameter is of order and degree as follows

a) Order 2, degree 2 b) Order 1, degree 3 c) Order 1, degree 1 d) Order 1, degree 2

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

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

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

5. Integrating factor of $(x+2y^3)\frac{dy}{dx}=y^2$ is

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

6. The curve in which the slope of the tangent at any point equals the ratio of the abscissa to the ordinate of the point is

a) An ellipse
b) A parabola
c) A rectangular hyperbola
d) A circle

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

a) $2xe^{\tan^{-1}y}=e^{2\tan^{-1}y}+c$ b) $xe^{\tan^{-1}y}=\tan^{-1}y+c$

c) $xe^{2\tan^{-1}y}=e^{\tan^{-1}y}+c$ d) $(x-2)=ce^{-\tan^{-1}y}$

8. The differential equation $(e^x + 1)y\,dy = (y+1)e^x\,dx$, has the solution
   a) $(y-1)(e^x-1) = ce^y$ b) $(y-1)(e^x+1) = ce^y$
   c) $(y+1)(e^x-1) = ce^y$ d) $(y+1)(e^x+1) = ce^y$

9. The differential equation of all straight lines passing through origin is
   a) $y = \sqrt{x}\frac{dy}{dx}$ b) $\frac{dy}{dx} = y + x$ c) $\frac{dy}{dx} = y - x$ d) None of these

10. The solution of the differential equation $\frac{dy}{dx} = \sin\ (x+y)\tan(x+y) - 1$ is
    a) $\text{cosec}(x+y) + \tan(x+y) = x + c$ b) $x + \text{cosec}(x+y) = c$
    c) $x + \tan(x+y) = c$ d) $x + \sec(x+y) = c$

11. The differential equation for which $\sin^{-1} x + \sin^{-1} y = c$ is given by
    a) $\sqrt{1-x^2}dy + \sqrt{1-y^2}dx = 0$ b) $\sqrt{1-x^2}\,dx + \sqrt{1-y^2}\,dy = 0$
    c) $\sqrt{1-x^2}\,dx - \sqrt{1-y^2}\,dy = 0$ d) $\sqrt{1-x^2}\,dy - \sqrt{1-y^2}\,dx = 0$

12. The integrating factor of $x\frac{dy}{dx} + (1+x)y = x$ is
    a) x b) $2x$ c) $e^{x\log x}$ d) xe^x

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

14. The order of the differential equation $\frac{d^2y}{dx^2} = \sqrt{1 + \left(\frac{dy}{dx}\right)^3}$, is
    a) 2 b) 1 c) 3 d) 4

15. The number of solutions of $y' = \frac{y+1}{x-1}$, $y(1) = 2$ is
    a) Zero b) One c) Two d) Infinite

16. The solution of the differential equation $x(x-y)\frac{dy}{dx} = y(x+y)$, is
    a) $\frac{x}{y} + \log(xy) = c$ b) $\frac{y}{x} + \log(xy) = c$ c) $\frac{x}{y} + y\log x = c$ d) $\frac{x}{y} + x\log y = c$

17. The general solution of differential equation $\frac{dy}{dx} = \frac{x^2}{y^2}$, is
    a) $x^3 - y^3 = C$ b) $x^3 + y^3 = C$ c) $x^2 + y^2 = C$ d) $x^2 - y^2 = C$

18. The solution of the differential equation $\frac{d^2y}{dx^2} = e^{-2x}$is $y = c_1e^{-2x} + c_2x + x_3$, where c_1 is

a) 1 b) $\frac{1}{4}$ c) $\frac{1}{2}$ d) 2

19. Solution of the equation $x\left(\frac{dy}{dx}\right)^2 + 2\sqrt{xy}\frac{dy}{dx} + y = 0$ is

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

20. Form of the differential equation of all family of lines $y = mx + \frac{4}{m}$ by eliminating the arbitrary constant m is

a) $\frac{d^2y}{dx^2} = 0$ b) $x\left(\frac{dy}{dx}\right)^2 - y\frac{dy}{dx} + 4 = 0$

c) $x\left(\frac{dy}{dx}\right)^2 + y\frac{dy}{dx} + 4 = 0$ d) $\frac{dy}{dx} = 0$