

Chapter 9 Differential Equations

Important MCQs Questions

Question 1: Solution of differential equation $xdy - ydx = Q$ represents

- (a) a rectangular hyperbola
- (b) parabola whose vertex is at origin
- (c) straight line passing through origin
- (d) a circle whose centre is at origin

Question 2: The curve for which the slope of the tangent at any point is equal to the ratio of the abscissa to the ordinate of the point is:

- (a) An ellipse
- (b) Parabola
- (c) Circle
- (d) Hyperbola

Question 3: What is the degree of differential equation $(y''')^2 + (y'')^3 + (y')^4 + y^5 = 0$?

- (a) 2
- (b) 3
- (c) 4
- (d) 5

Question 4: What is the differential equation of the family of circles touching the y-axis at the origin?

- (a) $2xyy' + x^2 = y^2$
- (b) $2xyy'' + x' = y^2$
- (c) $2xyy' - x^2 = y^2$
- (d) $xyy' + x^2 = y^2$

Question 5: The solution of $(x + \log y)dy + ydx = 0$ where $y(0) = 1$ is

- (a) $y(x - (A)) + y \log y = 0$
- (b) $y(x - 1 + \log y) + 1 = 0$
- (c) $xy + y \log y + 1 = 0$
- (d) None of these

Question 6: The number of arbitrary constants in the particular solution of a differential equation of third order is:

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

Question 7:

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

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

Answer: (b) $\log(1 + y) = x + \frac{x^2}{2} + k$

Question 8:

$\tan^{-1} x + \tan^{-1} y = c$ 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) $(1 + x^2)dx + (1 + y^2)dy = 0$

Question 9:

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

- (a) $e^{x^2-y} = c$
- (b) $e^{-y} + e^{x^2} = c$
- (c) $e^y = e^{x^2} + c$
- (d) $e^{x^2+y} = c$

Question 10:

The order and degree of the differential equation

$$\left(\frac{d^2y}{dx^3}\right)^2 - 3\frac{d^2y}{dx^2} + 2\left(\frac{dy}{dx}\right)^4 = y^4 \text{ are}$$

- (a) (1,4)
- (b) (3,4)
- (c) (2,4)
- (d) (3,2)

Answers

Question	Answer
1	(c) straight line passing through origin
2	(d) Hyperbola
3	(a) 2
4	(a) $2xyy' + x^2 = y^2$
5	(b) $y(x-1+\log y) + 1 = 0$
6	(d) 0
7	(b)
8	(c) $(1+x^2)dy + (1+y^2)dx = 0$
9	(c)
10	(d) (3,2)

