Differential Equations

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

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

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

(a) (1,4)

(b) (3,4)

(c) (2,4)

(d) (3,2)

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)