

## Chapter: Differential Equations (Order, Degree, and Variable Separable)

### General Instructions

1. Total Questions: **20**
2. Duration: **60 Minutes**
3. All questions are compulsory.
4. Read each question carefully before answering.
5. Choose the most appropriate answer from the given options.
6. Use of calculator or electronic devices is strictly prohibited.


[www.udgamwelfarefoundation.com](http://www.udgamwelfarefoundation.com)

1. Find the order and degree of the differential equation:  $y = x \frac{dy}{dx} + \frac{2}{\frac{dy}{dx}}$ .
2. Determine the order and degree of the differential equation:  $\frac{d^2y}{dx^2} = \sqrt[3]{1 + \left(\frac{dy}{dx}\right)^2}$ .
3. Form the differential equation of the family of ellipses having foci on the x-axis and center at the origin.
4. Find the order and degree of the differential equation representing the family of curves  $y = c_1 e^{x+c_2} + c_3 e^{-x}$ , where  $c_1, c_2, c_3$  are arbitrary constants.
5. Solve the differential equation:  $\frac{dy}{dx} = e^{x-y}(e^x - e^y)$ .
6. Find the equation of the curve passing through the point  $(1, 0)$  if the slope of the tangent to the curve at any point  $(x, y)$  is  $\frac{y-1}{x^2+x}$ .
7. Solve:  $\frac{dy}{dx} = \frac{x^2+xy+x}{x^2+x}$ .
8. Solve the differential equation:  $\frac{dy}{dx} = \frac{1}{\cos(x+y)}$ .
9. Find the particular solution of  $(1 + e^{2x})dy + (1 + y^2)e^x dx = 0$ , given that  $y = 1$  when  $x = 0$ .
10. Find the order and degree of the differential equation:  $x = \sin\left(\frac{dy}{dx}\right)$ .
11. Solve the differential equation:  $y - x \frac{dy}{dx} = a(y^2 + \frac{dy}{dx})$ .
12. A curve passes through  $(\frac{\pi}{4}, 0)$ . If the slope of the tangent at any point  $(x, y)$  is  $\frac{\sin y}{\cos x + \sin x}$ , find the equation of the curve.
13. Solve the differential equation:  $\frac{dy}{dx} = \frac{\sqrt{1-y^2}}{y}$ .
14. Form the differential equation of the family of circles touching the y-axis at the origin.
15. Solve:  $(x + y + 1) \frac{dy}{dx} = 1$ .
16. Find the particular solution of  $(1 + x^2) \frac{dy}{dx} + 2xy = \frac{1}{1+x^2}$ , given  $y = 0$  when  $x = 1$ .
17. Solve:  $\frac{dy}{dx} = \sec^2(x - y)$ .
18. Find the equation of the curve such that the sum of the intercepts made by the tangent at any point on the axes is always constant  $k$ .
19. Solve:  $x^2 \frac{dy}{dx} = y^2 + 2xy$  using the substitution  $y = vx$ .
20. Find the order and degree of  $\left[1 + \left(\frac{dy}{dx}\right)^2\right]^{3/2} = k \frac{d^2y}{dx^2}$ .

*www.udgamwelfarefoundation.com*

**For Best Mathematics E-Books, Visit:  
[www.mathstudy.in](http://www.mathstudy.in)**





*www.udgamwelfarefoundation.com*

**MASTER MATH FASTER & SMARTER!** 

Your Ultimate Digital Math Companion for Every Exam & Every Dream

✓ CBSE • ICSE • ISC • JEE • SAT • CAT • CTET • CUET & More!

**Why Choose MathStudy.in?**

-  Latest Pattern E-Books
-  Complete Chapter PDFs
-  Competitive Edge Gunkes
-  Case Study Based Learning

**Instant Access, Anytime**

**Unbelievably Affordable!**

**For Students:**

## Special Features

- ◆ **\*\*Board-Specific\*\*** – CBSE, ICSE, ISC, State Boards
- ◆ **\*\*Exam-Focused\*\*** – JEE, SAT, CAT, CTET, CUET, NTSE
- ◆ **\*\*Grade-Wise\*\*** – Class 6 to 12
- ◆ **\*\*Bilingual Options\*\*** – English & Hindi Medium Support
- ◆ **\*\*Printable & Shareable\*\*** – Use offline, anytime

## How to Order:

Visit : <https://www.mathstudy.in>

Browse by Exam, Class, or Topic

Add to Cart & Checkout

## Contact & Support:

✉ Email: [admin@mathstudy.in](mailto:admin@mathstudy.in)

💬 WhatsApp Support Available : +91-+91 92118 65759



💡 Why Wait? Empower your learning journey, save time, and achieve your dreams!

🌐 Explore & Start Learning Today:

<https://www.mathstudy.in> – Premium eBooks for success

<https://www.udgamwelfarefoundation.com> – Free PDFs, practice tests, & guida

**MathStudy.in – Empowering Learners, Enabling Educators, Encouraging Excellence.**  
**Digital Learning | Affordable Excellence | Trusted by Thousands**