

## CUET Mathematics Test - Set 16

### Chapter: Calculus - Continuity and Differentiability (Intermediate)

#### General Instructions

1. Total Questions: **15**
2. Duration: **60 Minutes**
3. All questions are compulsory.
4. Each question carries **5 marks**.
5. For each correct answer: **+5 marks**.
6. For each incorrect answer: **-1 mark**.
7. No negative marking for unanswered questions.
8. Use of calculator or electronic devices is strictly prohibited.
9. Choose the most appropriate answer from the given options.

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

1. If  $f(x) = \begin{cases} x^2 \sin(1/x) & x \neq 0 \\ 0 & x = 0 \end{cases}$ , then at  $x = 0$ , the function is:
- Discontinuous
  - Continuous but not differentiable
  - Differentiable and  $f'(0) = 0$
  - Differentiable and  $f'(0) = 1$
2. If  $y = \sec(\tan^{-1} x)$ , then  $dy/dx$  at  $x = 1$  is:
- $1/\sqrt{2}$
  - $\sqrt{2}$
  - $1/2$
  - $1$
3. Let  $f(x) = e^x$  and  $g(x) = \sin^{-1} x$ . The derivative of  $(g \circ f)(x)$  with respect to  $x$  is:
- $\frac{e^x}{\sqrt{1-e^{2x}}}$
  - $\frac{1}{\sqrt{1-e^{2x}}}$
  - $\frac{e^x}{1+e^{2x}}$
  - $e^x \sin^{-1} x$
4. If  $x^y = y^x$ , then  $dy/dx$  is equal to:
- $\frac{y(x \log y - y)}{x(y \log x - x)}$
  - $\frac{y(y - x \log y)}{x(x - y \log x)}$
  - $\frac{y}{x}$
  - $\frac{\log y}{\log x}$
5. If  $y = \sin(m \sin^{-1} x)$ , then  $(1 - x^2)y_2 - xy_1$  is equal to:
- $m^2 y$
  - $-m^2 y$
  - $my$
  - $0$
6. The derivative of  $\tan^{-1} \left( \frac{\cos x}{1 + \sin x} \right)$  with respect to  $x$  is:
- $1/2$
  - $-1/2$
  - $1$
  - $-1$
7. If  $f(x) = \log |x|$ , then for  $x \neq 0$ ,  $f'(x)$  is:
- $1/|x|$
  - $1/x$
  - $-1/x$
  - Does not exist
8. If  $x = \sqrt{a^{\sin^{-1} t}}$  and  $y = \sqrt{a^{\cos^{-1} t}}$ , then  $dy/dx$  is:
- $x/y$
  - $-y/x$
  - $y/x$
  - $-x/y$
9. Let  $f(x) = |\cos x|$ . The value of  $f'(\pi/4)$  is:
- $1/\sqrt{2}$
  - $-1/\sqrt{2}$

- (C) 0  
(D) Undefined
10. If  $y = \sin^{-1}(x\sqrt{1-x} - \sqrt{x}\sqrt{1-x^2})$ , then  $dy/dx$  is:  
 (A)  $\frac{1}{\sqrt{1-x^2}} - \frac{1}{2\sqrt{x}\sqrt{1-x}}$   
 (B)  $\frac{1}{\sqrt{1-x^2}} + \frac{1}{2\sqrt{x}\sqrt{1-x}}$   
 (C)  $\frac{1}{\sqrt{1-x^2}} - \frac{1}{\sqrt{1-x}}$   
 (D) 0
11. If  $f(x) = \frac{x}{1+|x|}$  for  $x \in \mathbb{R}$ , then  $f'(0)$  is:  
 (A) 0  
 (B) 1  
 (C) -1  
 (D) Does not exist
12. If  $y = e^{a \cos^{-1} x}$ , then  $(1-x^2)\frac{d^2y}{dx^2} - x\frac{dy}{dx} - a^2y$  is:  
 (A) 1  
 (B) 0  
 (C)  $a$   
 (D)  $2y$
13. The function  $f(x) = |x-3|\cos x$  is not differentiable at:  
 (A)  $x=0$   
 (B)  $x=\pi/2$   
 (C)  $x=3$   
 (D) None of these
14. If  $y = \log_a x + \log_x a + \log_x x + \log_a a$ , then  $dy/dx$  is:  
 (A)  $\frac{1}{x \log a} - \frac{\log a}{x(\log x)^2}$   
 (B)  $\frac{1}{x \log a} + \frac{\log a}{x(\log x)^2}$   
 (C)  $\frac{1}{x} + \frac{1}{x \log a}$   
 (D) 0
15. If  $y = \tan^{-1}\left(\frac{a+x}{1-ax}\right)$ , then  $dy/dx$  is:  
 (A)  $\frac{1}{1+a^2} + \frac{1}{1+x^2}$   
 (B)  $\frac{1}{1+x^2}$   
 (C)  $\frac{a}{1+a^2} + \frac{x}{1+x^2}$   
 (D)  $\frac{1}{1+(a+x)^2}$

*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**