# CUET Mathematics Test - Set 11

## Chapter: Relations, Functions, and Inverse Trigonometric Functions

**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.

1. Let $A = \{1, 2, 3\}$. The number of relations containing $(1, 2)$ and $(1, 3)$ which are reflexive and symmetric but not transitive is:
   (A) 1
   (B) 2
   (C) 3
   (D) 4

2. If $f : \mathbb{R} \to \mathbb{R}$ is defined by $f(x) = \frac{x}{1+x^2}$, then the function $f$ is:
   (A) One-one and Onto
   (B) Many-one and Onto
   (C) One-one but not Onto
   (D) Neither One-one nor Onto

3. Let $R$ be a relation on the set $A = \{a, b, c\}$ such that $R = \{(a, a), (b, b), (c, c), (a, b)\}$. To make $R$ an equivalence relation, the minimum number of ordered pairs to be added is:
   (A) 1
   (B) 2
   (C) 3
   (D) 4

4. The number of all onto functions from the set $\{1, 2, 3, \ldots, n\}$ to $\{a, b\}$ is:
   (A) $2^n$
   (B) $2^n - 1$
   (C) $2^n - 2$
   (D) $n^2$

5. The principal value of $\sin^{-1}(\sin 10)$ is:
   (A) 10
   (B) $10 - 3\pi$
   (C) $3\pi - 10$
   (D) $2\pi - 10$

6. If $f(x) = \sin^2 x + \sin^2(x + \pi/3) + \cos x \cos(x + \pi/3)$ and $g(5/4) = 1$, then $g(f(x))$ is:
   (A) $g(1)$
   (B) $g(5/4)$
   (C) $g(3/4)$
   (D) 1

7. The domain of $\cos^{-1}(2x - 1)$ is:
   (A) $[0, 1]$
   (B) $[-1, 1]$
   (C) $(-1, 1)$
   (D) $[0, \pi]$

8. The value of $\sin[2\cos^{-1}(-3/5)]$ is:
   (A) $24/25$
   (B) $-24/25$
   (C) $7/25$
   (D) $-7/25$

9. Let $f : [2, \infty) \to \mathbb{R}$ be the function $f(x) = x^2 - 4x + 5$. The range of the function is:
   (A) $\mathbb{R}$
   (B) $[1, \infty)$
   (C) $[4, \infty)$
   (D) $[5, \infty)$

10. If $\sin^{-1} x + \sin^{-1} y = 2\pi/3$, then $\cos^{-1} x + \cos^{-1} y$ is equal to:
    (A) $\pi/3$
    (B) $2\pi/3$
    (C) $\pi$
    (D) $\pi/6$

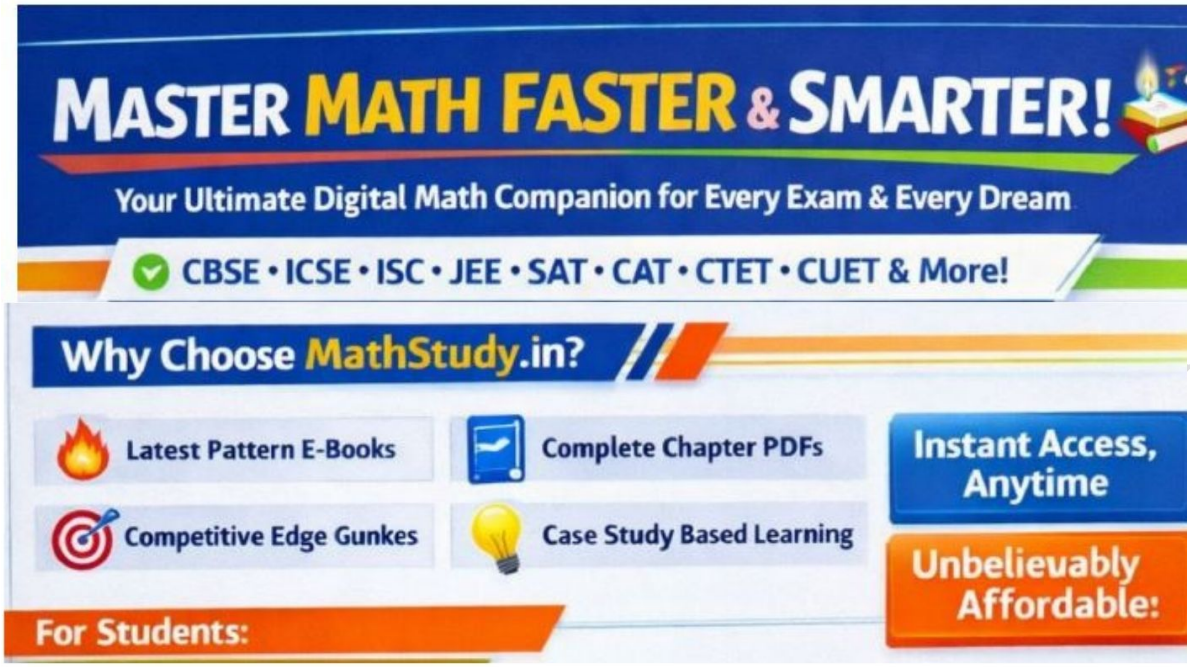
11. The relation $R = \{(a, b) : |a - b| \text{ is a prime number}\}$ on the set of integers is:
    (A) Reflexive
    (B) Symmetric
    (C) Transitive
    (D) None of these

12. If $f(x) = \frac{x-1}{x+1}$, then $f(f(x))$ is equal to:
    (A) $x$
    (B) $-1/x$
    (C) $1/x$
    (D) $-x$

13. The value of $\cot(\tan^{-1} a + \cot^{-1} a)$ is:
    (A) $a$
    (B) 0
    (C) $1/a$
    (D) Undefined

14. The number of elements in the range of the function $f(x) = \frac{x}{|x|}$ for $x \neq 0$ is:
    (A) 1
    (B) 2
    (C) 3
    (D) Infinite

15. $\tan^{-1}(1/2) + \tan^{-1}(1/3)$ is equal to:
    (A) $\pi/4$
    (B) $\pi/2$
    (C) $\tan^{-1}(5/6)$
    (D) $\pi/3$

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