

Topics : Inverse Trigonometric Function, Fundamentals of Mathematics, Quadratic Equation

Type of Questions

M.M., Min.

Single choice Objective (no negative marking) Q. 1, 2, 3 (3 marks, 3 min.)

[9, 9]

True or False (no negative marking) Q. 4 (2 marks, 2 min.)

[2, 2]

Subjective Questions (no negative marking) Q. 5, 6, 7, 8 (4 marks, 5 min.)

[16, 20]

1. $\cos \left(\sin^{-1} \frac{1}{2} + \cos^{-1} \frac{1}{3} \right) =$

(A) $\frac{\sqrt{3} + \sqrt{8}}{6}$

(B) $\frac{-\sqrt{3} + \sqrt{8}}{6}$

(C) $\frac{\sqrt{3} - \sqrt{8}}{6}$

(D) 0

2. $a^{\sqrt{\log_a b}} - b^{\sqrt{\log_b a}}$ (where $a, b > 0$ and $a, b \neq 1$) is equal to.

(A) 0

(B) ab

(C) $\sqrt{a-b}$

(D) None of these

3. $\tan \left(\tan^{-1} 5 + \cot^{-1} \frac{1}{3} \right) =$

(A) $\frac{4}{7}$

(B) $-\frac{4}{7}$

(C) $\frac{3}{7}$

(D) not defined

4. State true or false

(i) $\tan^{-1} \frac{\pi}{4} = 1$

(ii) $\cos^{-1} 0 = 1$

(iii) $\sin^{-1} \frac{\pi}{2} = \text{not defined}$

(iv) $\tan^{-1} x = \cot^{-1} \frac{1}{x}$

(v) $\operatorname{cosec}^{-1} x = \sin^{-1} \frac{1}{x}, |x| \geq 1$

5. For what values of $a \in \mathbb{R}$ does the equation $ax^2 + x + a - 1 = 0$ possess two distinct real roots x_1 and

x_2 satisfying the inequality $\left| \frac{1}{x_1} - \frac{1}{x_2} \right| > 1$?

6. Find the value of k if product of two of the roots of the equation $x^4 - 37x^3 + kx^2 + 808x - 1984 = 0$ is 62

7. Find the number of real solutions of the equation $x^2 + \left(\frac{x}{x-1} \right)^2 = 8$

8. Which is greater $\frac{\pi}{3}$ or $\tan^{-1} \frac{\pi}{3}$

Answers Key

1. (C) 2. (A) 3. (B)

4. (i) F (ii) F (iii) T (iv) F (v) T

5. For all $a \in (0, 1) \cup (1, 6/5)$ 6. 162

7. Three 8. $\frac{\pi}{3}$

