

Topic :- TRIGONOMETRIC FUNCTIONS

1. The most general value of θ which satisfies both the equations $\tan \theta = -1$ and $\cos \theta = 1/\sqrt{2}$ will be
 a) $n\pi + \frac{7\pi}{4}$ b) $n\pi + (-1)^n \frac{7\pi}{4}$ c) $2n\pi + \frac{7\pi}{4}$ d) None of these
2. If $\sin x + \sin^2 x = 1$, then the value of $\cos^{12} x + 3\cos^{10} x + 3\cos^8 x + \cos^6 x - 1$ is equal to
 a) 2 b) 1 c) 0 d) -1
3. The side of a triangle are $3x + 4y$, $4x + 3y$ and $5x + 5y$ units, where $x, y > 0$. The triangle is
 a) Right angled b) Equilateral c) Obtuse angled d) None of these
4. If the sides of a triangle are $x^2 + x + 1$, $x^2 - 1$, $2x + 1$, where $x > 1$, then the largest angle is
 a) 120° b) 60° c) 40° d) 30°
5. If p_1, p_2, p_3 are altitudes of a triangle ABC from the vertices A, B, C and Δ , the area of the triangle, then $p_1^{-1} + p_2^{-1} - p_3^{-1}$ is equal to
 a) $\frac{s-a}{\Delta}$ b) $\frac{s-b}{\Delta}$ c) $\frac{s-c}{\Delta}$ d) $\frac{s}{\Delta}$
6. In a ΔABC if $a = 26$, $b = 30$ and $\cos C = \frac{63}{65}$, then $r_2 =$
 a) 84 b) 45 c) 48 d) 24
7. The value of $\cos 1^\circ \cos 2^\circ \cos 3^\circ \dots \cos 100^\circ$ is equal to
 a) 1 b) -1 c) 0 d) None of these
8. The value of $\sin \frac{\pi}{2} + \sin \frac{2\pi}{7} + \sin \frac{3\pi}{7}$ is
 a) $\cot \frac{\pi}{14}$ b) $\frac{1}{2} \cot \frac{\pi}{14}$ c) $\tan \frac{\pi}{14}$ d) $\frac{1}{2} \tan \frac{\pi}{14}$
9. The value of x for the maximum value of $\sqrt{3} \cos x + \sin x$, is
 a) 30° b) 45° c) 60° d) 90°
10. $\sin^2 17.5^\circ + \sin^2 72.5^\circ$ is equal to
 a) $\cos^2 90^\circ$ b) $\tan^2 45^\circ$ c) $\cos^2 30^\circ$ d) $\sin^2 45^\circ$
11. If in ΔABC , $a \sin A = b \sin B$, then the triangle is
 a) Isosceles b) Right angled c) Equilateral d) None of these
12. $\sin^2 \theta = \frac{4xy}{(x+y)^2}$ is true if and only if
 a) $x + y \neq 0$ b) $x = y, x \neq 0, y \neq 0$ c) $x = y$ d) $x \neq 0, y \neq 0$
13. If $\cos \theta = \frac{1}{2} \left(x + \frac{1}{x} \right)$, then $\frac{1}{2} \left(x^2 + \frac{1}{x^2} \right)$ is equal to
 a) $\sin 2\theta$ b) $\cos 2\theta$ c) $\tan 2\theta$ d) None of these
14. $\operatorname{sech}^{-1}(\sin \theta)$ is equal to
 a) $\log \tan \frac{\theta}{2}$ b) $\log \sin \frac{\theta}{2}$ c) $\log \cos \frac{\theta}{2}$ d) $\log \cot \frac{\theta}{2}$
15. The number of solutions of the equation $2^{\cos x} = |\sin x|$ in $[-2\pi, 2\pi]$, is
 a) 1 b) 2 c) 3 d) 4

16. If the equation $\cos(\lambda \sin \theta) = \sin(\lambda \cos \theta)$ has a solution in $[0, 2\pi]$, then the smallest positive value of λ is

- a) $\frac{\pi}{\sqrt{2}}$ b) $\sqrt{2}\pi$ c) $\frac{\pi}{2}$ d) $\frac{\pi}{2\sqrt{2}}$

17. In the ambiguous case, given a, b and A . The difference between the two values of C is

- a) $2\sqrt{a^2 - b^2}$ b) $\sqrt{a^2 - b^2 \sin^2 A}$ c) $2\sqrt{a^2 - b^2 \sin^2 A}$ d) $\sqrt{a^2 - b^2}$

18. If $\tan \alpha = (1 + 2^{-x})^{-1}$, $\tan \beta = (1 + 2^{x+1})^{-1}$, then $\alpha + \beta$ equals

- a) $\pi/6$ b) $\pi/4$ c) $\pi/3$ d) $\pi/2$

19. The maximum value of $f(x) = \sin x(1 + \cos x)$ is

- a) $\frac{3\sqrt{3}}{4}$ b) $\frac{3\sqrt{3}}{2}$ c) $3\sqrt{3}$ d) $\sqrt{3}$

20. The value of $\cos \frac{\pi}{11} + \cos \frac{3\pi}{11} + \cos \frac{5\pi}{11} + \cos \frac{7\pi}{11} + \cos \frac{9\pi}{11}$, is

- a) 0 b) $-\frac{1}{2}$ c) $\frac{1}{2}$ d) 1