

## Topic :- TRIGONOMETRIC FUNCTIONS

1. The most general value of  $\theta$  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)  $120^\circ$                               b)  $60^\circ$                               c)  $40^\circ$                               d)  $30^\circ$
5. If  $p_1, p_2, p_3$  are altitudes of a triangle  $ABC$  from the vertices  $A, B, C$  and  $\Delta$ , 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  $\Delta ABC$  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)  $30^\circ$                                       b)  $45^\circ$                                       c)  $60^\circ$                                       d)  $90^\circ$
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  $\Delta ABC$ ,  $a \sin A = b \sin B$ , 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  $\lambda$  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

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