

## Topic :- TRIGONOMETRIC FUNCTIONS

1. In a  $\Delta ABC$ , angles  $A, B, C$  are in A.P., then  $\lim_{A \rightarrow C} \frac{\sqrt{3 - 4 \sin A \sin C}}{|A - C|}$  is equal to  
 a) 1                                      b) 2                                      c) 3                                      d) 4
2. For all values of  $\theta$ , the values of  $3 - \cos \theta + \cos\left(\theta + \frac{\pi}{3}\right)$  lie in the interval  
 a)  $[-2, 3]$                               b)  $[-2, 1]$                               c)  $[2, 4]$                               d)  $[1, 5]$
3. If  $\cos A = m \cos B$  and  $\cot \frac{A+B}{2} = \lambda \tan \frac{B-A}{2}$ , then  $\lambda$  is  
 a)  $\frac{m}{m-1}$                               b)  $\frac{m+1}{m}$                               c)  $\frac{m+1}{m-1}$                               d) None of these
4. The value of  $\cos^4\left(\frac{\pi}{8}\right) + \cos^4\left(\frac{3\pi}{8}\right) + \cos^4\left(\frac{5\pi}{8}\right) + \cos^4\left(\frac{7\pi}{8}\right)$  is  
 a) 0                                      b)  $\frac{1}{2}$                                       c)  $\frac{3}{2}$                                       d) 1
5. If  $\sin \theta = \frac{12}{13}$ ,  $(0 < \theta < \frac{\pi}{2})$  and  $\cos \phi = -\frac{3}{5}$   $(\pi < \phi < \frac{3\pi}{2})$ , then  $\sin(\theta + \phi)$  will be  
 a)  $-\frac{56}{61}$  b)  $-\frac{56}{65}$  c)  $\frac{1}{65}$  d)  $-\frac{56}{65}$
6. The quadratic equation whose roots are  $\sec^2 \theta$  and  $\operatorname{cosec}^2 \theta$  can be  
 a)  $x^2 - 2x + 2 = 0$                       b)  $x^2 + 5x + 5 = 0$                       c)  $x^2 - 4x + 4 = 0$                       d) None of these
7. If  $\sec \theta = m$  and  $\tan \theta = n$ , then  $\frac{1}{m} \left[ (m+n) + \frac{1}{(m+n)} \right]$  is  
 a) 2                                      b)  $2m$                                       c)  $2n$                                       d)  $mn$
8. If in a  $\Delta ABC$ ,  $\angle C = 90^\circ$ , then the maximum value of  $\sin A \sin B$  is  
 a)  $\frac{1}{2}$                                       b) 1                                      c) 2                                      d) None of these
9. In a cyclic quadrilateral  $ABCD$ , the value of  $\cos A + \cos B + \cos C + \cos D$ , is  
 a) 1                                      b) 0                                      c)  $-1$                                       d) None of these
10. If the angles of a triangle are in the ratio  $1 : 2 : 3$ , the corresponding sides are in the ratio  
 a)  $2 : 3 : 1$                               b)  $\sqrt{3} : 2 : 1$                               c)  $2 : \sqrt{3} : 1$                               d)  $1 : \sqrt{3} : 2$
11. If  $\sin(\pi \cos \theta) = \cos(\pi \sin \theta)$ , then the value of  $\cos\left(\theta + \frac{\pi}{4}\right)$  equals  
 a)  $\frac{1}{\sqrt{2}}$                                       b)  $\frac{1}{2\sqrt{2}}$                                       c)  $-\frac{1}{2\sqrt{2}}$                                       d)  $-\frac{1}{\sqrt{2}}$
12. The most general solution of  $2^{1+|\cos x| + \cos^2 x + |\cos^3 x| + \dots} = 4$  is given by  
 a)  $x = n\pi \pm \frac{\pi}{3}, n \in Z$   
 b)  $x = 2n\pi \pm \frac{\pi}{3}, n \in Z$   
 c)  $x = 2n\pi \pm \frac{2\pi}{3}, n \in Z$   
 d) None of these

13. If  $\cos \alpha + \cos \beta = 0 = \sin \alpha + \sin \beta$ , then  $\cos 2\alpha + \cos 2\beta =$   
 a)  $-2\sin(\alpha + \beta)$       b)  $-2\cos(\alpha + \beta)$       c)  $2\sin(\alpha + \beta)$       d)  $2\cos(\alpha + \beta)$
14. The value of the expression  $1 - \frac{\sin^2 y}{1 + \cos y} + \frac{1 + \cos y}{\sin y} - \frac{\sin y}{1 - \cos y}$  is equal to  
 a) 0      b) 1      c)  $\sin y$       d)  $\cos y$
15. In a  $\Delta ABC$ ,  $a = 2b$  and  $A = 3B$ , the  $A =$   
 a)  $90^\circ$       b)  $60^\circ$       c)  $30^\circ$       d)  $45^\circ$
16. If in a  $\Delta ABC$ ,  $A = \frac{\pi}{3}$  and  $AD$  is the median, then  
 a)  $2AD^2 = b^2 + c^2 + bc$   
 b)  $4AD^2 = b^2 + c^2 + bc$   
 c)  $6AD^2 = b^2 + c^2 + bc$   
 d) None of these
17. If  $\cos(\theta - \alpha) = a$ ,  $\cos(\theta - \beta) = b$ , then  $\sin^2(\alpha - \beta) + 2ab \cos(\alpha - \beta)$  is equal to  
 a)  $a^2 + b^2$       b)  $a^2 - b^2$       c)  $b^2 - a^2$       d)  $-a^2 - b^2$
18. If  $\cos \frac{x}{2} \cdot \cos \frac{x}{2^2} \cdot \dots \cdot \cos \frac{x}{2^n} = \frac{\sin x}{2^n \sin \frac{x}{2^n}}$ , then  
 $\frac{1}{2} \tan \frac{x}{2} + \frac{1}{2^2} \tan \frac{x}{2^2} + \dots + \frac{1}{2^n} \tan \frac{x}{2^n}$  is  
 a)  $\cot x - \cot \frac{x}{2^n}$       b)  $\frac{1}{2^n} \cot \left( \frac{x}{2^n} \right) - \cot x$   
 c)  $\frac{1}{2^n} \tan \left( \frac{1}{2^n} \right) - \tan x$       d)  $\frac{1}{2} \cot x - \frac{1}{2^n} \cot \left( \frac{x}{2^n} \right)$
19. In triangles  $ABC$  and  $DEF$ ,  $AB = DE$ ,  $AC = EF$  and  $\angle A = 2\angle E$ . Two triangles will have the same area if angle  $A$  is equal to  
 a)  $\pi/3$       b)  $\pi/2$       c)  $2\pi/3$       d)  $5\pi/6$
20. The value of  $\sin \left( \frac{\pi}{18} \right) \sin \left( \frac{5\pi}{18} \right) \sin \left( \frac{7\pi}{18} \right)$ , is  
 a)  $1/2$       b)  $1/4$       c)  $1/8$       d)  $1/16$