

**Class: 11**  
**Subject: Math**  
**Topic: Trigo**  
**No. of Questions: 25**

- If for real values of  $x$ ,  $\cos x = x + 1/x$ , then
  - $x > 90$
  - $x < 90$
  - $x = 90$
  - no value of  $x$  is possible
- What is the value of  $\sqrt{3} \operatorname{cosec} 20^\circ - \sec 20^\circ$ ?
  - 1
  - 2
  - 3
  - 4
- What is the value of  $\tan 9^\circ - \tan 27^\circ - \tan 63^\circ + \tan 81^\circ$ ?
  - 1
  - 2
  - 3
  - 4
- What is the value of  $\frac{\sec 8\theta - 1}{\sec 4\theta - 1}$ ?
  - $\frac{\tan 8\theta}{\tan 4\theta}$
  - $\frac{\tan 8\theta}{\tan 2\theta}$
  - $\frac{\tan (8\theta)}{\tan (\theta)}$
  - none of these

$$\geq 2^{1 - \frac{1}{\sqrt{2}}}$$

5. The value of  $x \in \mathbb{R}$ , for which  $2^{\sin x} + 2^{\cos x}$  does not hold true, is

- (A)  $\frac{\pi}{4}$
- (B)  $\frac{3\pi}{4}$
- (C)  $\frac{\pi}{2}$
- (D) None of these

6.  $\tan x$  is periodic with period

- (A)  $\frac{\pi}{2}$
- (B)  $\pi$
- (C)  $2\pi$
- (D)  $\frac{3\pi}{2}$

7. The period of  $\tan(x + 3x + 5x + 7x)$  is

- (A)  $\pi$
- (B)  $\frac{\pi}{12}$
- (C)  $\frac{\pi}{16}$
- (D)  $\frac{\pi}{2}$

8. Which of the following is correct?

- (A)  $\tan 1 = \tan 2$
- (B)  $\tan 1 = \frac{2}{3} \tan 2$
- (C)  $\tan 1 > \tan 2$
- (D)  $\tan 1 < \sin 2$

9. The magnitude of a radian is
- (A)  $180^\circ$
  - (B)  $58^\circ 59'$
  - (C)  $57^\circ 17' 44.8''$
  - (D)  $60^\circ$
10. For the trigonometric functions, which of the following statements is true?
- (A)  $|\cos x|$  is not a periodic function
  - (B) period of  $|\cos x|$  is the same as that of  $\cos x$
  - (C)  $|\cos x|$  and  $\tan x$  both have period  $\pi$
  - (D)  $\tan x$  has period  $\pi$ , but  $|\cos x|$  does not have period  $\pi$
11. The greatest value of  $\sin x \cos x$  is
- (A) 1
  - (B) 2
  - (C)  $1/2$
  - (D)  $1/4$
12. If  $\sin 2\theta = \cos 4\theta$ , then  $\theta$  is equal to
- (A)  $12^\circ$
  - (B)  $15^\circ$
  - (C)  $18^\circ$
  - (D)  $21^\circ$
13. If  $\theta$  is an acute angle and  $\sin \theta = \frac{p-6}{8-p}$ , then  $p$  must satisfy
- (A)  $6 \leq p < 8$
  - (B)  $6 \leq p < 7$
  - (C)  $3 \leq p \leq 4$
  - (D)  $4 \leq p < 7$

14. In a right angled triangle ABC, if  $\angle B = 90^\circ$  and  $AB : AC = \sqrt{3} : 2$ , find the measure of  $\angle A$ .
- (A)  $75^\circ$   
(B)  $60^\circ$   
(C)  $45^\circ$   
(D)  $30^\circ$
15. If  $u = \sin^6 x + \cos^6 x$ , then maximum and minimum values of  $u$  are
- (A)  $\pm 1/4$   
(B)  $\pm 1$   
(C) 1 and  $1/4$   
(D)  $1/4$  and  $-1$
16. If  $A = \frac{\pi}{8}$ , then  $(\cos 3A \cos 2A + \sin 2A \sin 3A) \sin A$  is equal to
- (A)  $\frac{1}{\sqrt{2}}$   
(B)  $\sqrt{2}$   
(C)  $\frac{1}{2\sqrt{2}}$   
(D) None of these
17. If  $\cot^2 \theta = \cot(\theta - \alpha) \cot(\theta - \beta)$ , then  $\cot 2\theta$  is equal to
- (A)  $\cot \alpha + \cot \beta$   
(B)  $1/2 (\cot \alpha + \cot \beta)$   
(C)  $1/2 (\tan \alpha + \tan \beta)$   
(D) None of these
18. The value of  $\sin 36^\circ \cdot \sin 72^\circ \cdot \sin 108^\circ \cdot \sin 144^\circ$  is
- (A)  $1/16$   
(B)  $3/16$   
(C)  $5/16$   
(D) None of these

19.  $\tan \frac{2\pi}{5} - \tan \frac{\pi}{15} - \sqrt{3} \tan \frac{2\pi}{5} \tan \frac{\pi}{15}$  is equal to
- (A)  $-\sqrt{3}$   
(B)  $1 - \sqrt{3}$   
(C) 1  
(D)  $\sqrt{3}$
20. If  $\tan \theta_1 = k \tan \theta_2$ , then  $\frac{\cos(\theta_1 - \theta_2)}{\cos(\theta_1 + \theta_2)}$  equals
- (A)  $\frac{1+k}{1-k}$   
(B)  $\frac{1-k}{1+k}$   
(C)  $\frac{k+1}{k-1}$   
(D)  $\frac{k-1}{k+1}$
21. If  $\cot x = -\frac{5}{12}$ ,  $x$  lies in second quadrant find the values of other five trigonometric functions.
22. Prove that  $\frac{\sin 5x - 2 \sin 3x + \sin x}{\cos 5x - \cos x} = \tan x$
23. Prove that  $\sin x + \sin 3x + \sin 5x + \sin 7x = 4 \cos x \cdot \cos 2x \cdot \sin 4x$
24. Prove that  $\cos^2 x + \cos^2 \left(x + \frac{\pi}{3}\right) + \cos^2 \left(x - \frac{\pi}{3}\right) = \frac{3}{2}$
25. Prove that  $\cos 2x \cdot \cos \frac{x}{2} - \cos 3x \cdot \cos \frac{9x}{2} = \sin 5x \sin \frac{5x}{2}$