

## INTRODUCTION TO TRIGONOMETRY

CM100801

### Very Short Answer Type Questions :

1 mark each

1. If  $\cos \theta = \frac{4}{5}$ , then the value of  $\tan \theta$  is :

- (a)  $\frac{3}{5}$                                       (b)  $\frac{3}{4}$                                       (c)  $\frac{4}{3}$                                       (d)  $\frac{5}{3}$

2. If  $a = b \tan \theta$ , then  $\frac{a \sin \theta + b \cos \theta}{a \sin \theta - b \cos \theta}$  is equal to :

- (a)  $\frac{a^2+b^2}{a^2-b^2}$                                       (b)  $\frac{a^2-b^2}{a^2+b^2}$                                       (c)  $\frac{a+b}{a-b}$                                       (d)  $\frac{a-b}{a+b}$

3.  $\sqrt{\frac{1-\sin 60^\circ}{2}}$  is equal to :

- (a)  $\sin 60^\circ$                                       (b)  $\sin 30^\circ$                                       (c)  $\sin 90^\circ$                                       (d)  $\sin 0^\circ$

4. The value of the expression  $\operatorname{cosec}(75^\circ + \theta) - \sec(15^\circ - \theta) - \tan(55^\circ + \theta) + \cot(35^\circ - \theta)$  is :

- (a)  $-1$                                       (b)  $0$                                       (c)  $1$                                       (d)  $\frac{3}{2}$

5. The value of  $\sqrt{\frac{1+\cos \theta}{1-\cos \theta}}$  is :

- (a)  $\cot \theta - \operatorname{cosec} \theta$                                       (b)  $\operatorname{cosec} \theta + \cot \theta$                                       (c)  $\operatorname{cosec}^2 \theta + \cot^2 \theta$                                       (d)  $\cot \theta + \operatorname{cosec}^2 \theta$

6.  $9 \sec^2 \theta - 9 \tan^2 \theta$  is equal to :

- (a)  $1$                                       (b)  $-1$                                       (c)  $9$                                       (d)  $-9$

7.  $\Delta ABC$  is a right angled at A, the value of  $\tan B \times \tan C$  is :

- (a)  $0$                                       (b)  $1$                                       (c)  $-1$                                       (d) none of these

8. If A is an acute angle in a right  $\Delta ABC$ , right angled at B, then the value of  $\sin A + \cos A$  is :

- (a) equal to one                                      (b) greater than one                                      (c) less than one                                      (d) equal to two

9. If  $2 \sin 2\theta = \sqrt{3}$ , then the value of  $\theta$  is :

- (a)  $90^\circ$                                       (b)  $30^\circ$                                       (c)  $45^\circ$                                       (d)  $60^\circ$

10. If  $\cot \theta = \frac{7}{8}$ , then the value of  $\frac{(1+\cos \theta)(1-\cos \theta)}{(1-\sin \theta)(1+\sin \theta)}$  is :

- (a)  $\frac{49}{64}$                                       (b)  $\frac{8}{7}$                                       (c)  $\frac{64}{49}$                                       (d)  $\frac{7}{8}$

### Short Answer Type Questions :

2 marks each

11. If  $\sqrt{3} \tan \theta = 1$ , then find the value of  $\sin^2 \theta - \cos^2 \theta$ .

12. Prove  $\frac{\tan^3 \theta - 1}{\tan \theta - 1} = \sec^2 \theta + \tan \theta$

13. If  $5 \tan \theta = 4$ , find the value of  $\frac{5 \sin \theta - 3 \cos \theta}{5 \sin \theta + 2 \cos \theta}$ .

14. If  $3 \cot A = 4$ , find the value of  $\frac{\cos ec^2 A + 1}{\cos ec^2 A - 1}$ .

15. Simplify :  $\left(\frac{1}{\cos \theta} + \frac{\sin \theta}{\cos \theta}\right) \left(\frac{1 - \sin \theta}{\cos \theta}\right)$ .

**Long Answer Type Questions :**

**3 marks each**

16. Prove :  $\tan^2 \theta + \cot^2 \theta = \sec^2 \theta \operatorname{cosec}^2 \theta - 2$ .

17. Prove  $(\sin^4 A - \cos^4 A + 1) \cos e c^2 A = 2$

18.  $\frac{\cos \alpha}{\cos \beta} = m$  and  $\frac{\cos \alpha}{\sin \beta} = n$ , then show that  $(m^2 + n^2) \cos^2 \beta = n^2$ .

19. Prove that :  $\sqrt{\frac{\sec \theta - 1}{\sec \theta + 1}} + \sqrt{\frac{\sec \theta + 1}{\sec \theta - 1}} = 2 \cos e c \theta$ .

20. Prove that  $\frac{\tan \theta - \cot \theta}{\sin \theta \cdot \cos \theta} = \tan^2 \theta - \cot^2 \theta$ .

21. Prove that :  $\frac{1 + \sec A}{\sec A} - \frac{\sin 2A}{1 - \cos A}$ .

**Very Long Answer Type Questions :**

**4 marks each**

22. If  $a \sin \theta + b \cos \theta = c$ , then prove that  $a \cos \theta - b \sin \theta = \sqrt{a^2 + b^2 - c^2}$

23. Prove that  $\frac{\sin \theta + \cos \theta}{\sin \theta - \cos \theta} + \frac{\sin \theta - \cos \theta}{\sin \theta + \cos \theta} = \frac{2}{\sin^2 \theta - \cos^2 \theta}$ .

24. Prove that  $\frac{\cos \theta}{1 - \sin \theta} + \frac{1 - \sin \theta}{\cos \theta} = 2 \sec \theta$ .

