

## 8. INTRODUCTION TO TRIGONOMETRY

### 1 MARK QUESTIONS

1. In right angled  $\triangle ABC$  at  $\angle B$ ,  $\sin A$  is equal to (a)  $-\cos A$  (b)  $\cos C$  (c)  $\sin C$  (d) *None of these*

2. If  $x$  increases from 0 to  $\frac{\pi}{2}$ , then value of  $\cos x$  is ...

3. If  $\tan \theta = \cot(60^\circ + \theta)$ , find the value of  $\theta$ .

4. If  $\sin A = 2/5$ , find the value of  $5 + 4 \cot^2 A$

5. If  $3 \tan \theta = 5$ , then  $\frac{3 \sin \theta - 5 \cos \theta}{3 \sin \theta + 5 \cos \theta}$  is equal to

(a)  $\frac{3}{5}$  (b)  $\frac{5}{3}$  (c) 1 (d) 0

6. For  $\sec A = \frac{17}{8}$ ,  $\frac{3 - 4 \sin^2 A}{4 \cos^2 A - 3}$  is equal to

(a)  $\frac{53}{611}$  (b)  $\frac{33}{611}$  (c)  $\frac{43}{611}$  (d)  $\frac{63}{611}$

7. When  $\theta$  increases, the value of  $\sin \theta$  .... Where  $0 \leq \theta \leq 90^\circ$ .

8. The values of the trigonometric ratios of an angle ...with the length of the sides of the triangle, if the angle remains the same.

9. Ravi asked Suresh about his age. Suresh replied to him the value of the following expression in my age. Then, Suresh's age is

$$15 \left| \frac{\sin^2 22^\circ + \sin^2 68^\circ}{\cos^2 22^\circ + \cos^2 68^\circ} + \sin^2 63^\circ + \cos 63^\circ \sin 27^\circ \right|^\circ$$

(a) 15 yr (b) 30 yr (c) 45 yr (d) 60 yr

10. For an acute angle  $\theta$ ,  $\sin \theta + \cos \theta$  takes the greatest value when  $\theta$  is

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

11. Given that  $\sin \alpha = \frac{1}{2}$  and  $\cos \beta = \frac{1}{2}$  what is the value of  $\alpha + \beta$  ?

12. If A and B are acute angles such that  $\sin A = \cos B$ , then A + B is equal to

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

13. If A and B are acute angles such that  $\sin A = \cos B$ , then (A+B) is equal to

(a)  $60^\circ$  (b)  $90^\circ$  (c)  $30^\circ$  (d)  $120^\circ$

14.  $\cos(90^\circ - \theta)$  is equal to ....

15. Trigonometric ratio can be determined in ....angled triangle only.

16. Given that  $\sin A = \frac{\sqrt{3}}{2}$  and  $\cos B = \frac{\sqrt{3}}{2}$ , what is the value of  $(A + B)$ ?

17. The value of

$$\frac{\tan 63^\circ + \cot 23^\circ}{\tan 27^\circ + \cot 67^\circ} - \tan 63^\circ \tan 67^\circ$$

is

- (a) 1            (b) 0            (c) 1            (d) None of these

18. Suppose  $0 \leq \theta, \phi \leq 90^\circ$  and  $\sin \theta$  and  $\cos \phi$  will be equal, when  $\theta$  and  $\phi$  equal to ...

19. The values of  $\cot \theta$  decrease from ....., where  $0 \leq \theta \leq 90^\circ$

20. The value of  $(\sin \theta + \cos \theta)^2 - 2 \sin(90^\circ - \theta) \cos(90^\circ - \theta)$  is equal

- (a)  $60^\circ$             (b)  $90^\circ$             (c)  $30^\circ$             (d)  $120^\circ$

21. Value of  $\tan 5^\circ \tan 10^\circ \tan 45^\circ \tan 80^\circ \tan 85^\circ$  is

- (a) 0            (b) 1            (c) 2            (d) 3

22. The value of  $\frac{\sin^2(90^\circ - \theta)}{\cos^2 \theta}$  is equal to ...

23. An equation involving trigonometric ratios of an angle is called ...

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

- (a)  $1/3$             (b)  $-1/3$             (c)  $-1/2$             (d)  $3/2$

25. If  $\theta$  is a complementary angle, then  $\sec \theta$  is equal to ....

26. If  $\tan(\theta_1 + \theta_2) = \sqrt{3}$  and  $\sec(\theta_1 - \theta_2) = \frac{2}{\sqrt{3}}$  then  $\sin 2\theta_1 + \tan 3\theta_2$  is equal to

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

27. The minimum value of  $\sec A$  and  $\operatorname{cosec} A$  is ...

28. If  $\tan A = \cot B$ , then  $A + B$  equals to

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

29. If  $\theta$  is an acute angle and  $\sin \theta = \cos \theta$ , then the value of  $2 \tan^2 \theta + \cos^2 \theta - 2$  is ...

30. If  $\sec A = 2$ , where  $A$  is acute, then find the value of  $\tan A$ .

31. Prove that :  $\sin \theta (1 + \tan \theta) + \cos \theta (1 + \cot \theta) = \sec \theta + \operatorname{cosec} \theta$

32. Without using trigonometric tables , evaluate the following.

$$\frac{\operatorname{cosec}^2(90^\circ - \theta) - \tan^2 \theta}{4(\cos^2 48^\circ + \cos^2 42^\circ)} - \frac{2 \tan^2 30^\circ \sec^2 52^\circ \sin^2 38^\circ}{(\operatorname{cosec}^2 70^\circ - \tan^2 20^\circ)}$$

33. The value of  $\frac{\cot^2 30^\circ + 8 \sin^2 45^\circ + \frac{3}{2} \sec^2 30^\circ + 2 \cos^2 90^\circ}{2 \sec 60^\circ + 3 \operatorname{cosec} 30^\circ - \frac{7}{3} \tan^2 60^\circ}$  is  
 (a) 3 (b) 4 (c) 5 (d) None of these
34. If  $\tan \alpha = 1$  and  $\sec \beta = \sqrt{2}$ , then  $\alpha + \beta$  is equal to  
 (a)  $60^\circ$  (b)  $90^\circ$  (c)  $30^\circ$  (d)  $120^\circ$
35. If  $\cos(40^\circ + x) = \sin 30^\circ$ , then the value of  $x$  is .....
36.  $(\cos^4 x - \sin^4 x)$  is equal to  
 (a)  $2 \sin^2 x - 1$  (b)  $1 - 2 \cos^2 x$  (c)  $\sin^2 x - \cos^2 x$  (d)  $2 \cos^2 x - 1$
37. The positive minimum value of  $\sec \theta$  is .....
38. Show that  $\cos \theta \left( \frac{1}{1 - \sin \theta} - \frac{1}{1 + \sin \theta} \right)$  can be written in the form  $k \tan \theta$  and find the value of  $k$ .
39. If  $\operatorname{cosec} \theta - \cot \theta = \frac{1}{2}$ ,  $0 < \theta < \frac{\pi}{2}$ , then  $\cos \theta$  is equal  
 (a)  $5/3$  (b)  $3/5$  (c)  $-3/5$  (d)  $-5/3$
40.  $\frac{\cos^3 20^\circ - \cos^3 70^\circ}{\sin^3 70^\circ - \sin^3 20^\circ}$  is equal to  
 (a) 0 (b) 1 (c) 2 (d) None of these
41. If  $7 \sin^2 \theta + 2 \cos^2 \theta = 4$ , then  $\sec \theta + \operatorname{cosec} \theta$  is equal to  
 (a)  $\frac{2}{\sqrt{3}} - 2$  (b)  $\frac{2}{\sqrt{3}} + 2$  (c)  $\frac{2}{\sqrt{3}}$  (d) None of these
42.  $\frac{\cos \theta}{\operatorname{cosec} \theta + 1} + \frac{\cos \theta}{\operatorname{cosec} \theta - 1}$  is equal to  
 (a)  $2 \cot \theta$  (b)  $2 \tan \theta$  (c)  $2 \cos \theta$  (d)  $2 \sin \theta$

### ANSWERS

- |                |                          |                            |                   |                                   |
|----------------|--------------------------|----------------------------|-------------------|-----------------------------------|
| 1. b           | 2. decreases             | 3. 15                      | 4. 15             | 5. d                              |
| 6. b           | 7. Increases from 0 to 1 | 8. Do not vary             | 9. b              | 10. b                             |
| 11. $90^\circ$ | 12. d                    | 13. b                      | 14. $\sin \theta$ | 15. Right                         |
| 16. $90^\circ$ | 17. b                    | 18. $\frac{\pi}{4}$        | 19. $\infty$ to 0 | 20. d                             |
| 21. b          | 22. 1                    | 23. Trigonometric Identity | 24. c             | 25. $\operatorname{cosec} \theta$ |

26. 2

27. 1

28. d

29.  $\frac{1}{2}$

30.  $\sqrt{3}$

31. -

32.  $-\frac{5}{12}$

33. a

34. b

35.  $20^\circ$

36. d

37. 1

38. 2

39. b

40. b

41. b

42. b

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