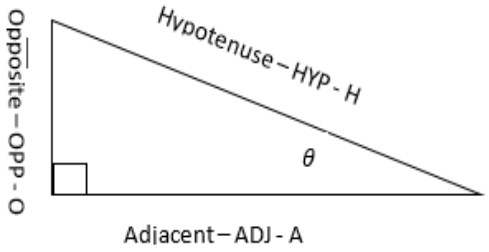
INTRODUCTION TO TRIGONOMETRY
CHAPTER-8
SYNOPSIS



Expression	Ratio
cosec θ	H/O
sec θ	H/A
cot θ	A/O

Expression	Ratio
sin θ	O/H
cos θ	A/H
tan θ	O/A

T-ratio	0^0	30^0	45^0	60^0	90^0
sin θ	0	½	$1/\sqrt{2}$	$\sqrt{3}/2$	1
cos θ	1	$\sqrt{3}/2$	$1/\sqrt{2}$	½	0
tan θ	0	$1/\sqrt{3}$	1	$\sqrt{3}$	Not Defined
cosec θ	Not Defined	2	$\sqrt{2}$	$2/\sqrt{3}$	1
sec θ	1	$2/\sqrt{3}$	$\sqrt{2}$	2	Not Defined

$\cot\theta$	Not Defined	$\sqrt{3}$	1	$1/\sqrt{3}$	0

TRIGNOMETRIC RATIOS OF SOME SPECIFIC ANGLES

Complementary Angle:

- $\sin\theta = \cos(90^0 - \theta)$
- $\cos\theta = \sin(90^0 - \theta)$
- $\tan\theta = \cot(90^0 - \theta)$
- $\cot\theta = \tan(90^0 - \theta)$
- $\sec\theta = \cos ec(90^0 - \theta)$
- $\text{cosec}\,\theta = \sec(90^0 - \theta)$

TRIGNOMETRIC IDENTITIES:

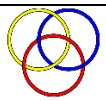
1. $sin^2\theta + cos^2\theta = 1$
2. $sec^2\theta - tan^2\theta = 1$
3. $cosec^2\theta - cot^2\theta = 1$

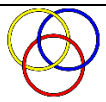
.		MCQ	level
1		Find the value of $\sin^2 20^\circ + \sin^2 70^\circ - \tan^2 45^\circ$ a) 0 b) 1 c) 2 d) 3	C
2		If cos (40+ x) = sin 30 , find the value of x.. a) 40 b) 30 c) 20 d) 1	C
3		Evaluate $\sin30^\circ \cos60^\circ + \cos30^\circ \sin60^\circ$ a) 0 b) 1 c) 2 d) 3	U

4		sin 4A = cos(A-20) find the value of A. a)20 b)22 c) 32 d) 30	U
5		If cos θ = 3/5, find the value of cot θ + cosec θ a) 1 b) 2 c) 3 d) 0	U
6		If cot θ =1/√3, evaluate $\frac{1-\cos^2\theta}{2-\sin^2\theta}$ a) 2/5 b) 3/5 c) 2/√3 d) 1/√3	HOT
7		If sin θ = 3/5 find the value of 4 tanθ + 3 sinθ – 6 cosθ a) 1 b) 0 c) -1 d) 4	
8		If tan θ = 4/3, find the value of $\frac{3\sin\theta+2\cos\theta}{3\sin\theta-2\cos\theta}$ a) 2 b)3 c) 4 d) 1	C
9		Evaluate $\frac{\tan45^\circ}{\sin30^\circ+\cos30^\circ}$ Find the value of x if cos x = a)√3 +1 b) √3 – 1 c) √3 d) 1- √3	U
10		Find the value of Sec50° sin40° + cos40° cosec50° a) 1 b) 0 c) 3 d) 2	U
11		$\frac{\tan50^\circ+\sec50^\circ}{\cot40+\operatorname{cosec}40}$ + cos40° cosec50° a) 1 b) 0 c) 3 d) 2	HOT
12		cos60° cos30° + sin 60° sin30° a) √3/2 b) 0 c) 1 d) 1/2	HOT
		SHORT ANSWER TYPE	MD
		1) If tanA = ¾ ,find the value of cosA. 2) If cosecA=√2 find the value of $\tan^2A-1$. 3) If sinA = ½ , find sin(2A).	

		4) Find the value of $(1- \sin^2 30)$. 5) Find the value of $\sin^2 A \times \operatorname{cosec}^2 A$. 6) Find the value of $\cot A \times \sin A \times \sec A$. 7) Find the value of $\frac{tan25}{cot65}$ 8) Find the value of $\sin 50 - \cos 40$. 9) Evaluate: $\sin 10 \times \sec 80 + 4\tan 45$. 10) Evaluate: $\sin^2 26 + \sin^2 64$. 11) Evaluate: $2(\cos^2 28 - \sin^2 62)$. 12) Evaluate: $\sin(30+A) - \cos(60-A)$.	

A.		Very Short Answer Questions (VSA) (1 Mark)	level
1		Find the value of x if $\tan 3x = \sin 45^\circ \cos 45^\circ + \sin 30$	C
2		Evaluate $4 \cot^2 45^\circ - \sec^2 60^\circ + \sin^2 60^\circ + \cos^2 90^\circ$	C
3		The maximum value of $\frac{1}{\operatorname{cosec}\theta}$	U
4		Prove $\frac{1- \tan^2 A}{\cot^2 A - 1} = \tan^2 A$ where $A \neq 45^\circ$	U
5		Sec A =Cosec B= $\frac{7}{12}$ then A+B= ----	U

6		In triangle ABC right angled at B, tan A = 1 Find the value of 2 sin A cos A	HOT
B.		Short Answer Questions (SA) (2 marks)	level
7		Tan A= $\frac{5}{12}$,find the value of (Sin A + Cos A) Sec A	C
8		Evaluate $\frac{5\sin^2 30^\circ + \cos^2 45^\circ - 4\tan^2 30^\circ}{2\sin 30^\circ \cos 30^\circ + \tan 45^\circ}$	U
9		If sin x+ cosec x = 2, find the value of $\sin^2 x + \text{cosec}^2 x$	U
10		$\sqrt{3}\tan\theta = 3\sin\theta$ then prove that $\text{Sin}^2\theta - \cos^2\theta = \frac{1}{3}$	HOT
11		Prove that $(\tan A - \tan B)^2 + (1 + \tan A \tan B)^2 = \sec^2 A \sec^2 B$	HOT
12		cos 9 $\theta = \sin\theta$, find the value of $\tan 5\theta$	MD
C.		Long Answer Questions (LA) (3 Marks)	
13		Evaluate $\frac{2\cos 67^\circ}{\sin 23^\circ} - \frac{\tan 40^\circ}{\cot 50^\circ} - \cos 0^\circ + \tan 15^\circ \tan 25^\circ \tan 60^\circ \tan 65^\circ \tan 75^\circ$	C
14		Evaluate $3\tan 25^\circ \tan 40^\circ \tan 50^\circ \tan 65^\circ - \frac{1}{2}\tan^2 60^\circ$	C

		$4(\cos^2 29^\circ + \cos^2 61^\circ)$	
15		If $\frac{\cos\alpha}{\cos\beta} = m$ and $\frac{\cos\alpha}{\sin\beta} = n$ show that $(m^2 + n^2)\cos^2\beta = n^2$	HOT
16		$\sin(A + B) = \sqrt{3}/2$, $\cos(2A - B) = 1/\sqrt{2}$ find A and B.	U
D.		Very Long Answer Questions (VLA) (4 Marks)	
17		$\frac{\cos A}{(1 - \tan A)} + \frac{\sin^2 A}{(\sin A - \cos A)} = \sin A + \cos A$	U
18		$\frac{\text{cosec } A}{\text{cosec}A - 1} + \frac{\text{cosec } A}{\text{cosec}A + 1} = 2\sec^2 A$	U
19		Prove that $\frac{1 + \cos\theta + \sin\theta}{1 + \cos\theta - \sin\theta} = \frac{1 + \sin\theta}{\cos\theta}$	U
20		Prove that $(1 + \tan^2 A)(1 + 1/\tan^2 A) = \frac{1}{Sin^2 A Cos^2 A}$	U
21		If $\cot\theta + \tan\theta = x$ and $\sec\theta - \cos\theta = y$, prove that $(x^2 y)^{\frac{2}{3}} - (xy^2)^{\frac{2}{3}} = 1$	HOT

22		Prove that $(\tan A - \tan B)^2 + (1 + \tan A \tan B)^2 = \sec^2 A \sec^2 B$	HOT
24		If $\sec A = x + 1/4x$, prove that $\sec A + \tan A = 2x$ or $1/2x$	HOT
25		Prove geometrically $\sin 30^\circ = \frac{1}{2}$	MD

INTRODUCTION TO TRIGONOMETRY

Answers

ANSWERS(MCQ)

1) 0 2) 20 3) 1 4) 22 5) 2 6) 3/5

7) 0 8) 3 9) √3 -1 10) 2 11) 2 12) √3/2

ANSWERS(SHORT ANSWER TYPE)

1)4/5 2) 0 3) √3/2 4) ½ 5) 1 6)1 7)1 8)0 9)5 10) 1 11)0 12)0

SECTION A

15 2) $\frac{3}{4}$ 3) 1 5) 90^{o} 6) 1

SECTION B

6) $\frac{17}{12}$ 8) $\frac{5}{6}(\sqrt{3}+2)$

9) 2 12) 1

SECTION C

13) √3 14) $\frac{3}{8}$ 16) A= 45, B=0