Question 23:

$\sin(A + B) = 1 \quad \sin(A + B) = \sin 90^\circ$

$\Rightarrow \quad A + B = 90^\circ \quad ----(1)$

$\cos(A - B) = 1 \Rightarrow \cos(A - B) = \cos 0^\circ$

$\Rightarrow \quad A - B = 0^\circ \quad ----(2)$

Adding (1) and (2), we get

$2A = 90^\circ \Rightarrow A = 45^\circ$

Putting $A = 45^\circ$ in (1) we get

$45^\circ + B = 90^\circ \; B = 45^\circ$

Hence, $A = 45^\circ$ and $B = 45^\circ$

Question 24:

$\sin(A - B) = \frac{1}{2} \Rightarrow \sin(A - B) = \sin 30^\circ$

$\Rightarrow \quad A - B = 30^\circ \quad -----(1)$

$\cos(A + B) = \frac{1}{2} \Rightarrow \cos(A + B) = \cos 60^\circ$

$\Rightarrow \quad A + B = 60^\circ \quad -----(2)$

Solving (1) and (2), we get

$2A = 90^\circ \Rightarrow A = 45^\circ$

Putting $A = 45^\circ$ in (1), we get

$45^\circ - B = 30^\circ \; B = 45^\circ - 30^\circ = 15^\circ$

Hence, $A = 45^\circ$, $B = 15^\circ$

Question 25:

$$\tan(A-B)=\frac{1}{\sqrt{3}} \Rightarrow \tan(A-B)=\tan 30^\circ$$

$$\Rightarrow \quad A-B=30^\circ \text{ ----- (1)}$$

$$\tan(A+B)=\sqrt{3} \Rightarrow \tan(A+B)=\tan 60^\circ$$

$$\Rightarrow \quad A+B=60^\circ \text{ ----- (2)} \left[\tan 60^\circ=\sqrt{3}\right]$$

Solving (1) and (2), we get

$2A = 90^\circ \quad \Rightarrow \quad A = 45^\circ$

Putting $A = 45^\circ$ in (1), we get

$45^\circ - B = 30^\circ \quad \Rightarrow \quad B = 45^\circ - 30^\circ = 15^\circ$

$A = 45^\circ, B = 15^\circ$

********** END **********