Trigonometry Questions for SSC Exams (CGL Tier 1, CGL Tier 2 & SSC 10+2)

TRIGONOMETRY QUIZ 1

Directions: Study the following questions carefully and choose the right answer:

(1). Find the value of $\frac{\tan 69^\circ + \tan 66^\circ}{1 - \tan 69^\circ \tan 66^\circ}$

A. 1 B. –1 C. 2 D.–2

(2). Show that the value of 3 sin 15° – 4 sin^3 15° is

A. $\frac{1}{\sqrt{3}}$ B. $\frac{1}{\sqrt{4}}$ C. $\frac{1}{\sqrt{2}}$ D. √3

(3). Evaluate: cos^2 45° - sin^2 15°.

A. $\frac{1}{\sqrt{2}}$ B. $\frac{\sqrt{2}}{3}$ C. $\frac{\sqrt{3}}{4}$ D. $\sqrt{4}$

(4). What is the value of sin 79° cos 19° - cos 79° sin 19°.

A. $\frac{\sqrt{3}}{2}$ B. $\frac{1}{\sqrt{2}}$ C. $\sqrt{2}$ D. $\sqrt{3}$

(5). What is the value of cos 70° cos 40° + sin 70° sin 40° ?

A. $\frac{1}{\sqrt{2}}$ B. $\sqrt{2}$ C. $\frac{\sqrt{3}}{2}$ D. $\sqrt{3}$

(6). If tan Θ = -1 and π/2 < Θ < π, find the value of sec Θ.

A. 2 B. $-\sqrt{2}$ C. $\sqrt{3}$ D. – 5

(7). Convert π /3 radians into degrees.

A. 123° B. 145° C. 150° D. 165°

(8). Convert 135° into radians.

A. $\frac{2\pi}{3}$ Radians

B. $\frac{3\pi}{4}$ Radians

C. $\frac{3\pi}{7}$ Radians

D. $\frac{2\pi}{5}$ Radians

(9). If sin Θ = $\frac{1}{2}$ and 0 < Θ < 2π, find the values of Θ.

A. $\frac{\pi}{6}$

B. $\frac{5\pi}{6}$

C. $\frac{2\pi}{3}$

D. Both A and B

(10). If 0 < Θ < 90°, solve the following equations:

$2\cos^2\Theta + \sin\Theta - 2 = 0$.

A. Θ = 0

B. Θ = $\frac{\pi}{6}$

C. Θ = 1

D. None of these

Correct Answers:

1	2	3	4	5	6	7	8	9	10
A	C	C	A	C	B	C	B	B	B

Explanations:

1.

$\frac{\tan 69° + \tan 66°}{1 - \tan 69° \tan 66°}$ = tan (69° + 66°) = tan135°

= tan (90° + 45°) = – cot 45° = –1.

Hence, option B is correct.

2.

Using the formula $3 \sin\Theta - 4 \sin^3\Theta = \sin 3\Theta$ and putting Θ = 15°

We get: $3 \sin 15° - 4 \sin^3 15° = \sin (3 \times 15°) = \sin 45° = \frac{1}{\sqrt{2}}$

Hence, option C is correct.

3.

We know that $\cos^2\Theta - \sin^2\Phi = \cos(\Theta + \Phi).\cos(\Theta - \Phi)$.

$\therefore \cos^2 45° - \sin^2 15° = \cos (45° + 15°).\cos (45° - 15°)$

$= \cos 60°.\cos 30° = \frac{1}{2} \times \frac{\sqrt{3}}{2} = \frac{\sqrt{3}}{4}$

Hence, option C is correct.

4.

sin 79° cos 19° - cos 79° sin 19°

By the formula,

sin(x - y) = sin(x) cos(y) - cos(x) sin(y)

= sin (79° - 19°) = sin 60°.

$= \frac{\sqrt{3}}{2}$

Hence, option A is correct.

5.

cos 70° cos 40° + sin 70° sin 40° = cos(70° - 40°)

$= \cos 30° = \frac{\sqrt{3}}{2}$

[because cos x cos y - sin x sin y = cos (x - y)]

Hence, option C is correct.

6.

Since $\frac{\pi}{2} < \Theta < \pi$, so Θ lies in 2nd quadrant.

And sec Θ is negative in 2nd quadrant.

$\therefore \sec\Theta = -\sqrt{1 + \tan^2\Theta} = -\sqrt{1 + (-1)^2} = -2.$

Hence, option B is correct.

7.

πc = 180°

$\therefore \left(\frac{5\pi}{6}\right)^c = \left(\frac{180}{\pi} \times \frac{5\pi}{6}\right)^\circ = 150°$

Hence, option C is correct.

8.

$180° = \pi c$

$\therefore\ 135° = \left(\frac{\pi}{180} \times 135\right)^{c} = \left(\frac{3\pi}{4}\right)$ radians.

Hence, option B is correct.

9.

$\sin\Theta = \frac{1}{2} = \sin\frac{\pi}{6} \Rightarrow \Theta = \frac{\pi}{6}$

Also, $\sin\Theta = \sin(\pi - \Theta)$

$\therefore \sin\frac{\pi}{6} = \sin\left(\pi - \frac{\pi}{6}\right) = \sin\frac{5\pi}{6}$.

Hence, the required values of Θ are $\frac{\pi}{6}$ and $\frac{5\pi}{6}$

Hence, option D is correct.

10.

$2\cos^2\Theta + \sin\Theta - 2 = 0 \Leftrightarrow 2(1 - \sin^2\Theta) + \sin\Theta - 2 = 0.$

$\Leftrightarrow 2\sin^2\Theta - \sin\Theta = 0 \Leftrightarrow \sin\Theta(2\sin\Theta - 1) = 0$

$\Leftrightarrow \sin\Theta = 0$ or $\sin\Theta = \frac{1}{2}$

As it's given that $0 < \Theta < 90°$, avoiding $\Theta = 0°$ we get

$\Leftrightarrow \sin\Theta = \frac{1}{2} = \sin 30° = \sin\frac{\pi}{6}$

Therefore, $\Theta = \frac{\pi}{6}$

Hence, option B is correct.