Quant Mega Quiz for SSC CGL Tier - 2

Q1. If cos x.cos y + sin x.sin y = –1 then cos x + cos y is
(a) –2
(b) 1
(c) 0
(d) 2

Q2. The value of the expression 2 ($\sin^6\theta + \cos^6\theta$) – 3 ($\sin^4\theta + \cos^4\theta$) + 1 is
(a) –1
(b) 0
(c) 1
(d) 2

Q3.
If $\cos\theta = \frac{x^2 - y^2}{x^2 + y^2}$ then the value of cot θ is equal to [if $0 \le \theta \le 90°$]
(a) $\frac{2xy}{x^2-y^2}$
(b) $\frac{2xy}{x^2+y^2}$
(c) $\frac{x^2+y^2}{2xy}$
(d) $\frac{x^2-y^2}{2xy}$

Q4. If x = cosec θ – sin θ and y = sec θ – cos θ, then the relation between x and y is
(a) $x^2 + y^2 + 3 = 1$
(b) $x^2y^2(x^2 + y^2 + 3) = 1$
(c) $x^2(x^2 + y^2 – 5) = 1$
(d) $y^2(x^2 + y^2 – 5) = 1$

Q5. If x tan 60° + cos 45° = sec 45° then the value of $x^2 + 1$ is
(a) 6/7
(b) 7/6
(c) 5/6
(d) 6/5

Q6. x, y be two acute angles, x + y < 90° and sin (2x – 20°) = cos (2y + 20°), the value of tan (x + y) is

(a) $\sqrt{3}$

(b) $\frac{1}{\sqrt{3}}$

(c) 1

(d) $2+\sqrt{2}$

Q7. If $a^2\sec^2x - b^2\tan^2x = c^2$ then the value of $\sec^2x + \tan^2x$ is equal to (assume $b^2 \neq a^2$)

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

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

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

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

Q8.

The value of $\frac{\sin\theta}{1+\cos\theta} + \frac{\sin\theta}{1-\cos\theta}$ is

(a) 2sin θ

(b) 2cos θ

(c) 2sec θ

(d) 2cosec θ

Q9. If $\tan^4\theta + \tan^2\theta = 1$ then the value of $\cos^4\theta + \cos^2\theta$ is

(a) 2

(b) 0

(c) 1

(d) –1

Q10. The value of $8(\sin^6\theta + \cos^6\theta) - 12(\sin^4\theta + \cos^4\theta)$ is equal to

(a) 20

(b) –20

(c) –4

(d) 4

Q11. If sin (x + y) sec (x – y) = 1, then find the value of $\tan^2 x + \cos^2 x + \text{cosec}^2 x$?

(a) 5/2

(b) 7/2

(c) 9/2

(d) 3/2

Q12.

$$\frac{\sin\theta}{\cot\theta+\operatorname{cosec}\theta}-\frac{\sin\theta}{\cot\theta-\operatorname{cosec}\theta}=?$$

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

Q13.

If $\frac{\tan A}{1-\cot A}+\frac{\cot A}{1-\tan A}=K+\tan A+\cot A$, then K = ?

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

Q14.

If $\frac{\cos^2\theta}{1-\tan\theta}+\frac{\sin^3\theta}{\sin\theta-\cos\theta}=K+\sin\theta\cos\theta$, then K = ?

(a) 1
(b) 2
(c) 3
(d) 4

Q15.

$$\frac{(1-\sin\theta+\cos\theta)^2}{(1+\cos\theta)(1-\sin\theta)}=?$$

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

Q16. $\sec^6\theta-\tan^6\theta-3\tan^2\theta.\sec^2\theta$?

(a) 1
(b) 3
(c) 2
(d) –1

Q17. $\operatorname{cosec}^6\theta-\cot^6\theta-3\cot^2\theta.\operatorname{cosec}^2\theta=?$

(a) 2
(b) –1
(c) 1
(d) 4

Q18.

$\frac{(\text{cosec}\,\theta-\sec\theta)(\cot\theta-\tan\theta)}{(\text{cosec}\,\theta+\sec\theta)(\sec\theta.\text{cosec}\,\theta-2)} = ?$

(a) 2
(b) 1
(c) 3
(d) –1

Q19.

If $\sin\theta + \cos\theta = \sqrt{2}\sin(90° - \theta)$, then $\cot\theta = ?$

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

Q20.

If $\cot\alpha = \frac{15}{8}$, then $\frac{(2+2\sin\alpha)(1-\sin\alpha)}{(1+\cos\alpha)(2-2\cos\alpha)} = ?$

(a) 125/8
(b) 225/64
(c) 64/225
(d) 8/125

Q21.

If $(r\cos\theta - \sqrt{3})^2 + (r\sin\theta - 1)^2 = 0$ then the value of $\frac{r\tan\theta+\sec\theta}{r\sec\theta+\tan\theta}$ is equal to

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

Q22. If x = a (sin + cosθ), y = b (sinθ-cosθ) then the value of $\frac{x^2}{a^2} + \frac{y^2}{b^2}$ is

(a) 0
(b) 1
(c) 2
(d) –2

Q23.

If $\sin 21° = \frac{x}{y}$, then $\sec 21° - \sin 69°$ is equal to

(a) $\frac{x^2}{y\sqrt{y^2-x^2}}$

(b) $\frac{y^2}{x\sqrt{y^2-x^2}}$

(c) $\frac{x^2}{y\sqrt{x^2-y^2}}$

(d) $\frac{y^2}{x\sqrt{x^2-y^2}}$

Q24. If a cos θ+b sinθ=p and a sinθ-b cosθ=q, then the relation between a, b, p and q is

(a) $a^2 - b^2 = p^2 - q^2$

(b) $a^2 + b^2 = p^2 + q^2$

(c) $a + b = p + q$

(d) $a - b = p - q$

Q25.

The numerical value of

$\frac{5}{\sec^2\theta} + \frac{1}{1+\cot^2\theta} + 3\sin^2\theta$ is

(a) 5

(b) 2

(c) 3

(d) 4

Q26.

If $x = a\sec\alpha\cos\beta, y = b\sec\alpha\sin\beta, z = c\tan\alpha$,

then the value of $\frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{z^2}{c^2}$ is

(a) 2

(b) 0

(c) 1

(d) –1

Q27.

If $\tan^2\theta = 1 - e^2$, *then* the value of $sec\theta + \tan^3\theta\, cosec\theta$ is

(a) $(2+e^2)^{\frac{3}{2}}$

(b) $(2-e^2)^{\frac{1}{2}}$

(c) $(2+e^2)^{\frac{1}{2}}$

(d) $(2-e^2)^{\frac{3}{2}}$

Q28.

$\sin^2 5° + \sin^2 10° + \sin^2 15° + \cdots + \sin^2 85° + \sin^2 90°$ *is equal to*

(a) 7 ½
(b) 8 ½
(c) 9
(d) 9 ½

Q29.

The expression $\frac{tan57°+cot37°}{\tan 33°+\cot 53°}$ is equal to

(a) tan 33° cot 57°
(b) tan 57° cot 37°
(c) tan 33° cot 53°
(d) tan 53° cot 37°

Q30.

If $\cos\theta + \sec\theta = \sqrt{3}$, then the value of $\cos^3\theta + \sec^3\theta$ is

(a) 0
(b) 1
(c) –1
(d) $\sqrt{3}$