Quant Mega Quiz for SSC CGL Tier - 2

Q1. Aaeroplane flying horizontally 1 km above the ground is observed at an elevation of 60°. If after 10 seconds, the elevation is observed to be 30° on the same side of observor, then uniform speed of the aeroplane will be

(a) 180 km/h
(b) 200 km/h
(c) 240 km/h
(d) $240\sqrt{3}$ km/h

Q2. AB is a vertical pole with end B on the ground and C is middle-point of AB. P is a point on the ground level. The portion AC subtends and angle β at P. If BP = nAB, then the value of tan β is

(a) $\frac{n}{n^2+1}$
(b) $\frac{n}{n^2+1}$
(c) $\frac{n}{2n^2+1}$
(d) $\frac{2n}{2n^2+1}$

Q3. The angles of elevation of the top of a tower (A) from the top (B) and bottom (D) at a building of height a are 30° and 45° respectively. If the tower and the building stand at the same level, then the height of the tower is

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

Q4. An aeroplane (P) flying at a height of 300 metres above the ground passes vertically above another plane (Q) at an instant when the angles of elevation of the two planes from the same point on the ground are 60° and 45° respectively. The height of the lower plane from the ground is

(a) 50 m
(b) 100 m
(c) $100\sqrt{3}$ m
(d) 105 $(\sqrt{3}+1)$m

Q5. The upper ¾th portion of a vertical pole subtends an angle $\tan^{-1}\left(\frac{3}{5}\right)$ at a point in the horizontal plane through its foot and at a distance 40 m from the foot. The height of the vertical pole is

(a) 20 m
(b) 40 m
(c) 60 m
(d) 80 m

Q6. A man standing in one corner of a square football field observes that the angle subtended by a pole in the corner just diagonally opposite to this corner is 60°. When he retrives 80 m from the corner along the same straight line, he finds the angle to be 30°. The length of the field, in m is –

(a) $40\sqrt{2}$
(b) 40
(c) $20\sqrt{2}$
(d) 20

Q7. The angles of elevation of the top of a tower from the points P & Q at distances of 'a' & 'b' respectively from the base of the tower and in the same straight line with it are complementary. Find the distance between top of tower and Q(if a>b) –

(a) $\sqrt{ab+1}$
(b) $a^2(b^2+1)$
(c) $\sqrt{b(a+b)}$
(d) $\frac{a}{b}+1$

Q8. A minar is 120 m high from sea's surface. A guard sees a yacht of enemy from minar, which makes an angle of depression 60°. Find the distance between yacht to foot of the minar.

(a) 180 m
(b) $180\sqrt{3}$ m
(c) $40\sqrt{3}$ m
(d) 60 m

Q9. From a tower 100 m high, the angle of depression of two objects which are in horizontal line through the base of the tower, are 45° & 30° and they are on the same side of the tower. The distance (in meters) between the object is ?

(a) $100\left(\sqrt{3}+1\right)$
(b) $100\sqrt{3}$
(c) $100\left(\sqrt{3}-1\right)$
(d) $\frac{100}{(\sqrt{3}-1)}$

Q10. A tower standing on a horizontal plane subtends a certain angle at a point 180 m apart from the foot of the tower. On advancing 120 m towards it, the tower is found to subtend an angle twice as before. The height of the tower is –

(a) $60\sqrt{3}$ m

(b) $100\sqrt{3}$ m

(c) $160\sqrt{3}$ m

(d) $200\sqrt{3}$ m

Q11.

If $\cos(\theta - A) = a, \cos(\theta - B) = b,$
then $\sin^2(A - B) + 2ab\cos(A - B)$ is equal to

(a) $a^2 - b^2$

(b) $a^2 + b^2$

(c) $b^2 - a^2$

(d) 2ab

Q12. $\cos 15° \cos 7\frac{1}{2}° . \cos 82\frac{1}{2}° = ?$

(a) 1/2

(b) 1/8

(c) 1/4

(d) 1/16

Q13. If(secα +tanα)(secβ+tanβ)(secγ+tanγ)=(secα-tanα)(secβ-tanβ)(secγ-tanγ), then each of the side is equal to

(a) ± 1

(b) -1

(c) $+1$

(d) 4

Q14. $\frac{2\cos 40° - \cos 20°}{\sin 20°} = ?$

(a) 0

(b) $\sqrt{3}$

(c) -1

(d) 2

Q15. $2\sqrt{2}\sin 10°\left(\frac{\sec 5°}{2} + \frac{\cos 40°}{\sin 5°} - 2\sin 35°\right) = ?$

(a) 1

(b) 4

(c) $\sqrt{2}$

(d) -1

Q16. If $\frac{\tan\theta+\cot\theta}{\tan\theta-\cot\theta} = 2$, $(0 \le \theta \le 90°)$, then the value of $\sin\theta$ is

(a) $\frac{2}{\sqrt{3}}$

(b) $\frac{\sqrt{3}}{2}$

(c) $\frac{1}{2}$

(d) 1

Q17. $\frac{2\sin 68°}{\cos 22°} - \frac{2\cot 15°}{5\tan 75°} - \frac{3\tan 45°.\tan 20°.\tan 40°.\tan 50°.\tan 70°}{5}$ is equal to

(a) –1

(b) 0

(c) 1

(d) 2

Q18. If $\cos^4\theta - \sin^4\theta = \frac{2}{3}$, then the value of $2\cos^2\theta - 1$ is

(a) 0

(b) 1

(c) 2/3

(d)3/2

Q19. If $\sin\alpha \sec(30° + \alpha) = 1$ $(0 < \alpha < 60°)$, then the value of $\sin\alpha + \cos 2\alpha$ is

(a) 1

(b) $\frac{2+\sqrt{3}}{2\sqrt{3}}$

(c) 0

(d) $\sqrt{2}$

Q20. If $\frac{\sin\theta+\cos\theta}{\sin\theta-\cos\theta} = 3$, then the value of $\sin^4\theta - \cos^4\theta$ is

(a) 1/5

(b) 2/5

(c) 3/5

(d) 4/5

Q21. If $9\cos\theta + 12\sin\theta = 15$, $0° < \theta < 90°$, then the value of $\cot\theta$ is

(a) 3/4

(b) 3/5

(c) 4/5

(d) 4/3

Q22. If $\text{cosec}\theta - \cot\theta = \frac{1}{\sqrt{3}}$, then the value of $\frac{\text{cosec}\theta}{\cot\theta}$ is

(a) 0

(b) 1

(c) 2

(d) $1/\sqrt{3}$

Q23. If $9\sin^2\theta + 5\cos^2\theta = 8$, then the value of $\cot\theta$ is (θ is acute)

(a) 0

(b) 1

(c) $\sqrt{3}$

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

Q24. If $\tan\theta - \cot\theta = 0$, then find the value of $(\text{cosec}\theta - \sin\theta)\,(2\sec\theta - \cos\theta)\,(\cot\theta + \tan\theta)$

(a) 0

(b) 1

(c) 2

(d) 3

Q25. If $\sin A(1+\sin A) = 1$, then the value of $2\cos^2 A\,(1+\cos^2 A)$ is

(a) 0

(b) 1

(c) 2

(d) 4

Q26. If $\cos(\theta - A) = a$, $\cos(\theta - B) = b$, then $\sin^2(A-B) + 2ab\cos(A-B)$ is equal to

(a) a^2-b^2

(b) a^2+b^2

(c) b^2-a^2

(d) 2ab

Q27. $\cos 15^\circ \cos 7\frac{1}{2}^\circ . \cos 82\frac{1}{2}^\circ = ?$

(a) 1/2

(b) 1/8

(c) 1/4

(d) 1/16

Q28. If (secα +tanα) (secβ+tanβ) (secγ+tanγ) = (sec α-tan α)(sec β-tan β)(sec γ-tan γ), then each of the side is equal to

(a) ±1

(b) − 1

(c) + 1

(d) 4

Q29. $\frac{2\cos 40^\circ - \cos 20^\circ}{\sin 20^\circ} = ?$

(a) 0

(b) √3

(c) – 1

(d) 2

Q30. $2\sqrt{2}\sin 10^\circ \left(\frac{\sec 5^\circ}{2} + \frac{\cos 40^\circ}{\sin 5^\circ} - 2\sin 35^\circ\right) = ?$

(a) 1

(b) 4

(c) √2

(d) – 1