Quant Mega Quiz for SSC CGL – Advance Level

Q1. If $x^{y+z} = 1$, $y^{x+z} = 1024$ and $z^{x+y} = 729$ (x, y and z are natural numbers), then what is the value of $(z + 1)^{y+x+1}$?
(a) 6561
(b) 10000
(c) 4096
(d) 14641

Q2. If $N = (12345)^2 + 12345 + 12346$, then what is the value of $\sqrt{N}$?
(a) 12346
(b) 12345
(c) 12344
(d) 12347

Q3. If $\sqrt{(1-p^2)(1-q^2)} = \frac{\sqrt{3}}{2}$, then what is the value of $\sqrt{2p^2+2q^2+2pq} + \sqrt{2p^2+2q^2-2pq}$?
(a) 2
(b) $\sqrt{2}$
(c) 1
(d) None of these

Q4. If $A = 1 + 2^P$ and $B = 1 + 2^{-P}$, then what is the value of B?
(a) (A + 1)/(A – 1)
(b) (A + 2)/(A + 1)
(c) A/(A – 1)
(d) (A – 2)/(A + 1)

Q5. If $a \cos\theta - b \sin\theta = c$, then what is the value of $a \sin\theta + b \cos\theta$?
(a) $\pm\sqrt{a^2+b^2+c^2}$
(b) $\pm\sqrt{a^2-b^2+c^2}$
(c) $\pm\sqrt{a^2+b^2-c^2}$
(d) $\pm\sqrt{a^2-b^2-c^2}$

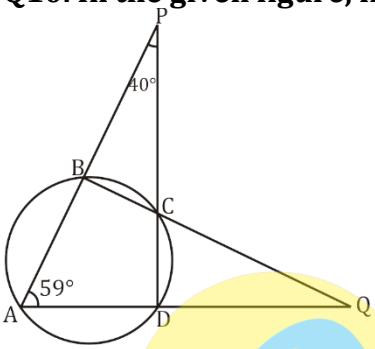
Q6. What is $\frac{\sin^6\theta-\cos^6\theta}{\sin^2\theta-\cos^2\theta}$ equal to?
(a) $\sin^4\theta - \cos^4\theta$
(b) $1 - \sin^2\theta\cos^2\theta$
(c) $1 + \sin^2\theta\cos^2\theta$
(d) $1 - 3\sin^2\theta\cos^2\theta$

Q7. If $p = a \sin x + b \cos x$ and $q = a \cos x - b \sin x$, then what is the value of $p^2 + q^2$?
(a) a + b
(b) ab
(c) $a^2 + b^2$
(d) $a^2 - b^2$

Q8. What is $(\sin x \cos y + \cos x \sin y)(\sin x \cos y - \cos x \sin y)$ equal to?
(a) $\cos^2 x - \cos^2 y$
(b) $\cos^2 x - \sin^2 y$
(c) $\sin^2 x - \cos^2 y$
(d) $\sin^2 x - \sin^2 y$

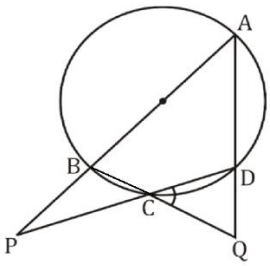
Q9. Consider the following statements
I. Let ABCD be a parallelogram which is not a rectangle. then, $2(AB^2 + BC^2) \neq AC^2 + BD^2$
II. If ABCD is a rhombus with AB = 4 cm, then $AC^2 + BD^2 = n^3$ for some positive integer *n*.
Which of the above statements is/are correct ?
(a) Only I
(b) Only II
(c) Both I and II
(d) Neither I nor II

Q10. In the given figure, if ∠PAQ = 59°, ∠APD = 40°, then what is ∠AQB ?



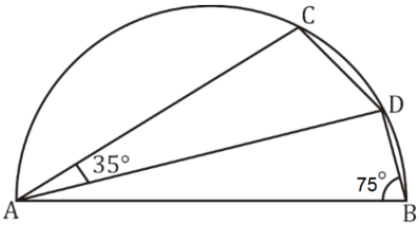
(a) 19°
(b) 20°
(c) 22°
(d) 27°

Q11. In the given figure, if $\frac{x}{3} = \frac{y}{4} = \frac{z}{5}$, where ∠DCQ = *x*, ∠BPC = *y* and ∠DQC = *z*, then what are the values of *x*, *y* and *z*, respectively ?



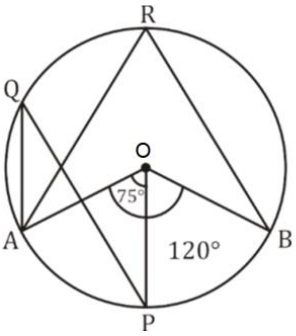
(a) 33°, 44° and 55°
(b) 36°, 48° and 60°
(c) 39°, 52° and 65°
(d) 42°, 56° and 70°

Q12. In the figure given above, C and D are points on the semi-circle described on AB as diameter. If ∠ABD = 75° and ∠DAC = 35°, then what is the ∠BDC?



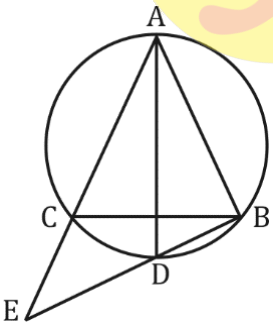
(a) 130°
(b) 110°
(c) 90°
(d) 100°

Q13. In the figure given above, if ∠AOP = 75° and ∠AOB = 120°, then what is the value of ∠AQP ?



(a) 45°
(b) 37.5°
(c) 30°
(d) 22.5°

Q14. In the given figure, ABC is an equilateral triangle and AD is the angle bisector of ∠A. Then find the value of ∠CEB.



(a) 30°
(b) 15°
(c) 45°
(d) 60°

Q15. The angle of elevation of the top of the tower observed from each of the three points A, B, C on the ground, forming a triangle is the same angle 'α'. If 'a' is the length of the side of the Triangle ABC, then the height of the tower is

(a) $\frac{a}{\sqrt{2}}\sin\alpha$

(b) $\frac{2a}{\sqrt{3}}\cos\alpha$

(c) $2a\cot\alpha$

(d) $\frac{a}{\sqrt{3}}\tan\alpha$

Q16. The angle of elevation of the top of an incomplete vertical pillar at a horizontal distance of 100 meter from its base is 45. If the angle of elevation of the top of the complete pillar at the same point is to be 60, then the height of the incomplete pillar is to be increased by

(a) $50\sqrt{2}$ m

(b) 100 m

(c) $100(\sqrt{3}-1)$ m

(d) $100(\sqrt{3}+1)$ m

Q17. If $a = \sqrt{7+2\sqrt{12}}$ & $b = \sqrt{7-2\sqrt{12}}$, then find the value of $a^3 + b^3$?

(a) 24

(b) 28

(c) 56

(d) 52

Q18. If $a^2 + 3a + 3 = 0$. Find the value of $a^3 + 6a^2 + 12a + 10$ =?

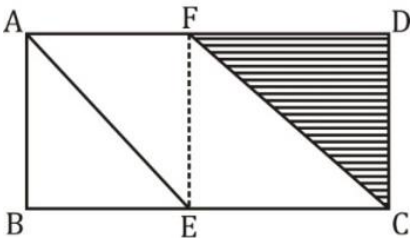
(a) $2\sqrt{2}$

(b) 0

(c) 1

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

Q19. In the given figure. ABCD is a rectangle. The area of the isosceles right angle triangle ABE = 7 cm^2, EC = 3 (BE). The area of the shaded region (in cm^2) is,



(a) 21 cm^2

(b) 28 cm^2

(c) 42 cm^2

(d) 56 cm^2

Q20. The area of the triangle whose vertices are (a, a) (a+1, a+1) and (a+2, a) is

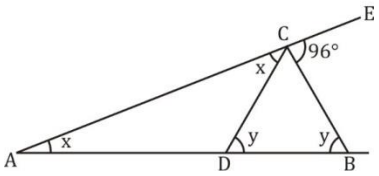
(a) a^3

(b) 1

(c) 2a

(d) $2^{\frac{1}{2}}$

Q21. In the figure (not drawn to scale) given below. If AD = CD = BC and ∠BCE = 96°, how much is the value of ∠DBC ?



(a) 32°

(b) 84°

(c) 64°

(d) can't be determined

Q22. A rectangular sheet of paper, when halved by folding it at the mid-point of its longer side, results in a rectangle, whose longer and shorter sides are in the same ratio as of the original rectangle. If the shorter side of the original rectangle is 2, what is the area of the smaller rectangle ?

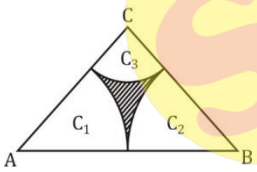
(a) $4\sqrt{2}$

(b) $2\sqrt{2}$

(c) $\sqrt{2}$

(d) None of these

Q23. Find the area of the shaded region given that all three circular arcs and are of equal radii 'r' and A, B and C are the centre C_1, C_2 and C_3 respectively.



(a) $(2\sqrt{3} - \pi)\ r^2/2$

(b) $(2\sqrt{3} - \pi)\ r^2/3$

(c) $(\sqrt{3} - \pi)\ r^2/2$

(d) $(\sqrt{3} - \pi)\ r^2$

Q24. A sphere of radius 25 cm is cut by a plane whose distance from the centre of the sphere is 15 cm. What is the circumference of the plane circular section?

(a) 10π cm

(b) 24π cm

(c) 42π cm

(d) 40π cm

Q25. A sphere of radii 14 cm is melted. Molten metal is further utilized to make a cone of radii 21 cm. Find the height of the cone?

(a) $\frac{225}{8}$ cm

(b) $\frac{225}{24}$ cm

(c) $\frac{224}{9}$ cm

(d) $\frac{224}{23}$ cm