

Quant Mega Quiz for SSC Tier-1 (Solutions)

S1. Ans.(d)

Sol.

$$N_1 : N_2 : N_3 \\ 50 : 10 : 100$$

% increase N_2 in to make it equal to N_1

$$= \frac{50-10}{10} \times 100 = 400\%$$

S2. Ans.(c)

Sol.

$$\frac{2714}{5074} = \frac{23 \times 118}{43 \times 118} = \frac{23}{43}$$

S3. Ans.(a)

Sol.

$$\operatorname{cosec} 120^\circ = \operatorname{cosec} (90^\circ + 30^\circ)$$

$$= \sec 30^\circ = \frac{2}{\sqrt{3}}$$

S4. Ans.(a)

Sol.

$$2\pi r = 22 \Rightarrow r = \frac{7}{2} \text{ cm}$$

$$\pi r^2 h = 770 \Rightarrow h = 20 \text{ cm}$$

$$\text{Curved surface area} = 2\pi r h$$

$$= 2 \times \frac{22}{7} \times \frac{7}{2} \times 20$$

$$= 440 \text{ cm}^2$$

S5. Ans.(b)

Sol.

$$\text{Sum of interior angles} = (n - 2) \times 180^\circ$$

$$= (14 - 2) \times 180^\circ$$

$$= 2160^\circ$$

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S6. Ans.(a)

Sol.

$$\begin{aligned} \text{Distance} &= \frac{5 \times 0.35}{(7-5)} \text{ km} \\ &= 0.875 \text{ km} = 875 \text{ m} \end{aligned}$$

S7. Ans.(a)

Sol.

ATQ,

$$\frac{(A \times 25)}{\frac{3}{4}} = \frac{(A+B) \times 5}{\frac{1}{4}}$$

$$\frac{A}{B} = \frac{3}{2}$$

$$\text{Total work} = \frac{3 \times 25}{\left(\frac{3}{4}\right)} \text{ or } \frac{(3+2) \times 5}{\frac{1}{4}}$$

$$= 100 \text{ units}$$

$$\text{B, alone} = \frac{100}{2} = 50 \text{ days.}$$

S8. Ans.(a)

Sol.

Let the nos be

$$\underbrace{(n-28), (n-26), \dots, n, \dots, (n+26), (n+28)}_{14 \text{ nos}}$$

When the total nos are odd then the middle no is always their mean.

$$\therefore n = 60$$

$$\text{Highest no.} = n + 28 = 88$$

S9. Ans.(b)

Sol.

$$\begin{aligned} &[4(2x - 3y) + 5(x + 4y)] - [5(2x - y)] \\ &= [13x + 8y] - [10x - 5y] \\ &= 3x + 13y \end{aligned}$$

S10. Ans.(d)

Sol.

$$\text{From, } 3(2 - 3x) < 2 - 3x \Rightarrow x > \frac{2}{3}$$

$$\text{From, } 2 - 3x \geq 4x - 6 \Rightarrow x \leq \frac{8}{7}$$

From given options, only (d) X= 1 satisfies both equations.

S11. Ans.(d)

Sol.

$$(1004)^{2008} + 1002$$

Unit digit

$$4^{\text{odd power}} \Rightarrow 4$$
$$4^{\text{even power}} \Rightarrow 6$$
$$\Rightarrow 6 + 2$$
$$\Rightarrow 8 \leftarrow \text{unit digit}$$

S12. Ans.(d)

Sol.

$$(7)^{71} \times (6)^{63} \times 3^{65}$$
$$\Rightarrow (7^4)^{17} \times 7^3 \times (6)^{63} \times (3^4)^{16} \times 3$$
$$\Rightarrow (1)^{17} \times 3 \times (6) \times (1)^{16} \times 3$$
$$\Rightarrow 3 \times 6 \times 1 \times 3$$
$$\Rightarrow 4 \leftarrow \text{unit digit}$$

S13. Ans.(c)

Sol.

$$(22)^{23}$$
$$\Rightarrow (2^4)^5 \times 2^3$$
$$\Rightarrow (6)^5 \times 8$$
$$\Rightarrow 6 \times 8$$
$$\Rightarrow 8 \leftarrow \text{unit digit}$$

S14. Ans.(c)

Sol.

$$\Rightarrow (2153)^{167}$$
$$\Rightarrow (3^4)^{41} \times (3)^3$$
$$\Rightarrow (1)^{41} \times (7)$$
$$\Rightarrow 7 \leftarrow \text{unit digit}$$

S15. Ans.(b)

Sol.

Let weight of container $\Rightarrow x$
Weight of water $\Rightarrow y$
 $x + y = 2.25$
ATQ,
 $x + \frac{2}{10}y = 0.77 \text{ kg}$
 $y = \frac{37}{20}$
 $x + \frac{37}{20} = 2.25$
 $x = 2.25 - 1.85$
 $= 0.40 \text{ kg}$



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Weight when 0.4 part is full

$$\begin{aligned} &= x + \frac{4}{10}y \\ &= 0.40 + \frac{4}{10} \times \frac{37}{20} \\ &= 0.40 + 0.74 \\ &= 1.14 \text{ kg} \end{aligned}$$

S16. Ans.(d)

Sol.

$$\begin{aligned} &\Rightarrow \frac{67^{67} + 67}{68} \\ &\Rightarrow \frac{(67^{67} + 1) + 66}{67 + 1} \end{aligned}$$

$(x^n + 1)$ is divisible by $(x + 1)$ only when n is odd

$$\frac{(67^{67} + 1)}{67 + 1} = \text{Remainder is } 0$$

$$\frac{66}{67+1} = \text{Remainder is } 66$$

S17. Ans.(d)

Sol.

Sum of squares of n natural number

$$= \frac{n(n + 1)(2n + 1)}{6}$$

Sum of squares of number from 1 to 10.

$$= \frac{10 \times 11 \times 21}{6}$$

$$= 385$$

$$\text{Answer} = 385 - 1 = 384$$

S18. Ans.(b)

Sol.

$$1^3 + 2^3 + \dots + 10^3 = 3025$$

$$4 + 32 + 108 + \dots + 4000$$

$$\Rightarrow 4(1 + 8 + 27 + \dots + 1000)$$

$$\Rightarrow 4(1 + 2^3 + 3^3 + \dots + 10^3)$$

$$= 4 \times 3025$$

$$= 12100$$

S19. Ans.(d)

Sol.

$$\frac{7}{6} = 1.16$$

$$\frac{7}{9} = 0.77$$

$$\frac{4}{5} = 0.8$$

$$\frac{5}{7} = 0.714$$

Smallest $\Rightarrow 5/7$

S20. Ans.(b)

Sol.

$$0.\overline{001}$$
$$= \frac{1}{999}$$

S21. Ans.(c)

Sol.

$$x^2 + 3x - 18$$
$$\Rightarrow x^2 + 6x - 3x - 18$$
$$\Rightarrow x(x + 6) - 3(x + 6)$$
$$\Rightarrow (x - 3)(x + 6)$$

S22. Ans.(d)

Sol.

Time = Distance/Relative speed

$$\frac{44}{60} = \frac{x}{39}$$
$$\frac{44 \times 39}{60} = x$$

$$28.6 \text{ km} = x$$

S23. Ans.(a)

Sol.

$$x^2 - (\text{sum of roots})x + \text{product of the roots} = 0$$

$$x^2 - (-7)x + 12 = 0$$

$$x^2 + 7x + 12 = 0$$

S24. Ans.(d)

Sol.

Effective discount

$$= -20 - 10 + 2$$

$$= 28\%$$

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S25. Ans.(b)

Sol.

$$\begin{aligned} 2530/1430 \\ = 23/13 \end{aligned}$$

S26. Ans.(b)

Sol.

$$\begin{aligned} 5x - 3 &\geq 3 + x/2 \\ 10x - 6 &\geq 6 + x \\ 9x &\geq 12 \\ x &\geq 4/3 \\ x &\geq 1.33 && \dots(i) \\ 4x - 2 &\leq 6 + x \\ 3x &\leq 8 \\ x &\leq 8/3 \\ x &\leq 2.66 && \dots(ii) \\ \text{from (i) \& (ii)} \\ 1.33 &\leq x \leq 2.66 \\ x &= 2 \end{aligned}$$

S27. Ans.(a)

Sol.

$$\begin{aligned} \text{1st term} &= 32 \\ \text{Last term} &= -43 \\ S_n &= \frac{n}{2} [\text{1st term} + \text{last term}] \\ -88 &= \frac{n}{2} [32 - 43] \\ -176 &= n[-11] \\ n &= 16 \end{aligned}$$

S28. Ans.(a)

Sol. If difference of S.I & C.I for 2 years is given than we can use the following formula

$$\begin{aligned} \text{C.I} - \text{S.I} &= P \left(\frac{R}{100} \right)^2 \\ 81 &= \frac{P \times 18 \times 18}{10000} \\ P &= \text{Rs } 2500 \end{aligned}$$

S29. Ans.(a)

Sol. Points (12, -1) & (-3, 4)

if the line segment joining above points is divided by y axis then $x = 0$

Let it divides it is the ratio $m : n$

$$\begin{aligned} x &= \frac{mx_2 + nx_1}{m + n} \\ 0 &= \frac{m(-3) + 12n}{m + n} \\ 3m &= 12n \\ m : n &= 4 : 1 \end{aligned}$$

S30. Ans.(b)

Sol. Slope of line passing through (4, 3) (y, 0) is

$$\begin{aligned} m_1 &= \frac{y_2 - y_1}{x_2 - x_1} \\ &= \frac{0 - 3}{y - 4} \\ &= \frac{-3}{y - 4} \end{aligned}$$

Slope of line passing through (-1, -2) (3, 0) is

$$\begin{aligned} m_2 &= \frac{y_2 - y_1}{x_2 - x_1} \\ &= \frac{0 - (-2)}{3 - (-1)} \\ &= \frac{2}{4} \end{aligned}$$

If two lines are parallel then, their slopes are equal

$$\begin{aligned} m_1 &= m_2 \\ \frac{-3}{y - 4} &= \frac{1}{2} \\ -6 &= y - 4 \\ y &= -2 \end{aligned}$$

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