

Quantitative Aptitude for RRB NTPC (Solutions)

S1. Ans.(b)

Sol.

$$4^{4x+1} = \frac{1}{64}$$

$$4^{4x+1} = 4^{-3}$$

$$4x + 1 = -3$$

$$x = -1$$

S2. Ans.(b)

Sol.

$$\sqrt{2^x} = 256$$

$$2^{x/2} = 2^8$$

$$x/2 = 8, x = 16$$

S3. Ans.(d)

Sol.

$$\frac{(\sqrt{5})^7}{(\sqrt{5})^5} = 5^P$$

$$\sqrt{5}^2 = 5^P$$

$$5^{2/2} = 5^P$$

$$P = 1$$

S4. Ans.(a)

Sol.

$$\frac{a}{b} \rightarrow \frac{0.04}{1.5}$$

$$\Rightarrow \frac{1.5 - 0.04}{1.5 + 0.04}$$

$$\Rightarrow \frac{1.46}{1.54}$$

$$\Rightarrow \frac{146}{154} \Rightarrow \frac{73}{77}$$

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S5. Ans.(c)

Sol.

$$\begin{aligned}x &= (\sqrt{2} + 1)^{1/3} \\x^3 - \frac{1}{x^3} \\&= \sqrt{2} + 1 - \frac{1}{\sqrt{2} + 1} \\&= \sqrt{2} + 1 - (\sqrt{2} - 1) \\&= \sqrt{2} + 1 - \sqrt{2} + 1 \\&= 2\end{aligned}$$

S6. Ans.(b)

Sol.

$$\begin{aligned}\frac{x^2 - x + 1}{x^2 + x + 1} &= \frac{3}{2} \\x \left(x - 1 + \frac{1}{x} \right) &= \frac{3}{2} \\x \left(x + 1 + \frac{1}{x} \right) &= \frac{3}{2} \\2x + \frac{2}{x} - 2 &= 3x + \frac{3}{x} + 3 \\x + \frac{1}{x} &= -5\end{aligned}$$

S7. Ans.(c)

Sol.

$$\begin{aligned}x &= 3 + \sqrt{8} \\ \frac{1}{x} &= \frac{1}{3 + \sqrt{8}} \\ \frac{1}{x} &= 3 - \sqrt{8} \\ x^2 &= (3 + \sqrt{8})^2 \\ &= 9 + 8 + 6\sqrt{8} \\ \frac{1}{x^2} &= 9 + 8 - 6\sqrt{8} \\ x^2 + \frac{1}{x^2} &= 9 + 8 + 9 + 8 \\ &= 34\end{aligned}$$

S8. Ans.(a)

Sol.

$$\begin{aligned}a &= 11, b = 9 \\ \frac{a^2 + b^2 + ab}{a^3 - b^3} \\ &= \frac{(a - b)(a^2 + b^2 + ab)}{(a - b)(a^2 + b^2 + ab)} \\ &= \frac{1}{a - b} = \frac{1}{2}\end{aligned}$$

S9. Ans.(b)

Sol.

$$\begin{aligned}\frac{2x - y}{x + 2y} &= \frac{1}{2} \\ 4x - 2y &= x + 2y \\ 3x &= 4y \\ \frac{x}{y} &= \frac{4}{3} \\ \frac{3x - y}{3x + y} &= \frac{12 - 3}{12 + 3} \\ &= \frac{9}{15} = \frac{3}{5}\end{aligned}$$

S10. Ans.(b)

Sol.

$$\begin{aligned}\sqrt{1 - \frac{x^3}{100}} &= \frac{3}{5} \\ 1 - \frac{x^3}{100} &= \frac{9}{25} \\ \frac{16}{25} &= \frac{x^3}{100} \\ x &= 4\end{aligned}$$

S11. Ans.(c)

Sol.

$$\begin{aligned}\sqrt{(3 - x)^2 + (2)^2} &= 2 \\ (3 - x)^2 + 4 &= 4 \\ (x - 3)^2 &= 0 \\ x &= 3\end{aligned}$$

S12. Ans.(c)

Sol.

$$\begin{aligned}\text{Midpoint} &\Rightarrow \left(\frac{3+5}{2}, \frac{12+4}{2}\right) \\ &= (4, 8)\end{aligned}$$

S13. Ans.(b)

Sol.

$$\begin{aligned}&\left(\frac{6 - 2}{2}, \frac{10 + 4}{2}\right) \\ &= (2, 7)\end{aligned}$$

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S14. Ans.(a)

Sol.

All the points lie on the same line

They will not form a triangle

Area of $\Delta ABC = 0$

$$\frac{1}{2} [x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)] = 0$$

$$\frac{1}{2} [-1(5 - k) + 2(k - 4) + 3(4 - 5)] = 0$$

$$-5 + k + 2k - 8 - 3 = 0$$

$$3k = 16$$

$$k = 16/3$$

S15. Ans.(d)

Sol.

Mid points of AC = $(5, 15/2)$

Mid points of BD = $(5, 15/2)$

B $(-5, -4)$, D (x, y)

$$5 = \frac{-5 + x}{2}$$

$$x = 15$$

$$\frac{15}{2} = \frac{-4 + y}{2}$$

$$y = 19$$

$$(15, 19)$$

S16. Ans.(b)

Sol.

Vertices of centroid

$$\Rightarrow \left(\frac{x_1 + x_2 + x_3}{3}, \frac{y_1 + y_2 + y_3}{3} \right)$$

$$\Rightarrow \left(\frac{10}{3}, \frac{7}{3} \right)$$

S17. Ans.(d)

Sol.

Given triangle is an equilateral triangle

Incenter is same as centroid.

$$\left(\frac{1 + 2 + 0}{3}, \frac{\sqrt{3}}{3} \right)$$

$$= \left(1, \frac{1}{\sqrt{3}} \right)$$

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S18. Ans.(b)

Sol.

Slope of line

$$x - 2y - 5 = 0$$

$$-2y = -x + 5$$

$$y = \frac{1}{2}x - 5$$

$$m = \frac{1}{2}$$

Slope of line parallel to above line = $1/2$

$$(y - y_1) = m(x - x_2)$$

$$(y + 4) = \frac{1}{2}(x - 2)$$

$$2y + 8 = x - 2$$

$$x - 2y - 10 = 0$$

S19. Ans.(d)

Sol.

$$\text{Slope, } m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{5 - 3}{3 - 5}$$

$$= \frac{2}{-2} = -1$$

Equation

$$y - 3 = -1(x - 5)$$

$$y - 3 = -x + 5$$

$$x + y - 8 = 0$$

S20. Ans.(c)

Sol.

$$a^2x - ay + 1 = 0$$

$$-ay = -a^2x - 1$$

$$y = ax + 1/a$$

$$\text{Slope} = a$$

S21. Ans.(a)

Sol.

$$\frac{2}{5} \& \frac{4}{9}$$

$$\frac{2}{5} = 0.4, \quad \frac{4}{9} = 0.44$$

$$\frac{3}{7} = 0.42$$

$$\frac{2}{3} = 0.66$$

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

$$\frac{1}{2} = 0.5$$

$$\frac{3}{7} \text{ is in between } \frac{2}{5} \& \frac{4}{9}$$

S22. Ans.(c)

Sol.

$$x + x + 2 + x + 4 = 147$$

$$3x = 141$$

$$x = 47$$

$$\text{Middle Number} = 47 + 2$$

$$= 49$$

S23. Ans.(a)

Sol.

$$(122)^{173}$$

$$= (2^4)^{43} \times 2^1$$

$$= 6 \times 2 = 2$$

S24. Ans.(a)

Sol.

$$\frac{2}{8} = 0.25$$

$$\frac{3}{5} = 0.6$$

$$\frac{8}{11} = 0.72$$

$$\frac{11}{17} = 0.64$$

$$\text{Largest No.} \Rightarrow \frac{8}{11}$$

S25. Ans.(a)

Sol.

$$\frac{1}{\sqrt{2} + 1} = \frac{\sqrt{2} - 1}{2 - 1}$$

$$= \sqrt{2} - 1$$

$$= 1.414 - 1$$

$$= 0.414$$

S26. Ans.(a)

Sol.

$$\sqrt{11 - 2\sqrt{30}} = \sqrt{5 + 6 - 2\sqrt{30}}$$

$$= \sqrt{(\sqrt{5})^2 + (\sqrt{6})^2 - 2\sqrt{5}\sqrt{6}}$$

$$= \sqrt{6} - \sqrt{5}$$

$$\sqrt{7 - 2\sqrt{10}} = \sqrt{5 + 2 - 2\sqrt{10}}$$

$$= \sqrt{(\sqrt{5})^2 + (\sqrt{2})^2 - 2\sqrt{5}\sqrt{2}}$$

$$= \sqrt{5} - \sqrt{2}$$

BILINGUAL



RRB NTPC 4.0

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2 PM to 3 PM

$$\begin{aligned}
 \sqrt{8 - 4\sqrt{3}} &= \sqrt{6 + 2 - 2\sqrt{12}} \\
 &= \sqrt{(\sqrt{6})^2 + (\sqrt{2})^2 - 2\sqrt{6}\sqrt{2}} \\
 &= \sqrt{(\sqrt{6} - \sqrt{2})^2} \\
 &= \sqrt{6} - \sqrt{2} \\
 \frac{1}{\sqrt{6} - \sqrt{5}} - \frac{3}{\sqrt{5} - \sqrt{2}} - \frac{4}{\sqrt{6} - \sqrt{2}} \\
 &= \sqrt{6} + \sqrt{5} - \frac{3(\sqrt{5} + \sqrt{2})}{3} - \frac{4(\sqrt{6} + \sqrt{2})}{4} \\
 &= \sqrt{6} + \sqrt{5} - \sqrt{5} - \sqrt{2} - \sqrt{6} - \sqrt{2} \\
 &= -2\sqrt{2}
 \end{aligned}$$

S27. Ans.(b)

Sol.

$$\begin{aligned}
 x &= 3 + 2\sqrt{2} \\
 &= 2 + 1 + 2\sqrt{2} \\
 x &= (\sqrt{2} + 1)^2 \\
 \sqrt{x} &= \sqrt{2} + 1 \\
 \frac{1}{\sqrt{x}} &= \frac{1}{\sqrt{2} + 1} \times \frac{\sqrt{2} - 1}{\sqrt{2} - 1} \\
 &= \sqrt{2} - 1 \\
 \sqrt{x} - \frac{1}{\sqrt{x}} &= \sqrt{2} + 1 - \sqrt{2} + 1 \\
 &= 2
 \end{aligned}$$

S28. Ans.(d)

Sol.

H.C.F × L.C.M = Product of Numbers

$$108 \times \text{L.C.M} = 20736$$

$$\text{L.C.M} = 192$$

S29. Ans.(b)

Sol.

H.C.F of Fraction

$$\begin{aligned}
 &= \frac{\text{H. C. F of (Numerator)}}{\text{L. C. M of Denominator}} \\
 &= \frac{\text{H. C. F (2, 4, 6)}}{\text{L. C. M (3, 5, 7)}} \\
 &= \frac{2}{105}
 \end{aligned}$$

S30. Ans.(d)

Sol.

$$\begin{aligned}
 x \times \frac{20}{100} &= 120 \\
 x &= 600 \\
 120\% \text{ of } 600 &= 720
 \end{aligned}$$

