

Mathematics Mega Quiz For RRB NTPC (Solutions)

S1. Ans.(c)

Sol. Member in team A $\Rightarrow x$

Member in team B $\Rightarrow y$

ATQ,

$$3(x - 3) = y + 3$$

$$y + 3 = 3x - 9$$

$$3x - y = 12 \quad \dots(i)$$

$$(y - 2) = 2(x + 2)$$

$$y - 2 = 2x + 4$$

$$2x - y = -6 \quad \dots(ii)$$

From (i) & (ii)

$$x = 18$$

$$y = 42$$

S2. Ans.(a)

Sol.

$$\frac{6^2 + 7^2 + 8^2 + 9^2 + 10^2}{\sqrt{7 + 4\sqrt{3}} - \sqrt{4 + 2\sqrt{3}}}$$

$$= \frac{36 + 49 + 64 + 81 + 100}{36 + 49 + 64 + 81 + 100}$$

$$= \frac{\sqrt{4 + 3 + 2 \times 2\sqrt{3}} - \sqrt{1 + 3 + 2\sqrt{3}}}{200 + 130}$$

$$= \frac{\sqrt{(2 + \sqrt{3})^2} - \sqrt{(1 + \sqrt{3})^2}}{330}$$

$$= \frac{330}{2 + \sqrt{3} - 1 - \sqrt{3}} = 330$$

S3. Ans.(a)

Sol.

$$\text{Student wearing spectacles} = 1400 \times \frac{1}{4} = 350$$

$$\text{Boys wearing spectacles} = 350 \times \frac{2}{7} = 100$$

$$\text{Girls wearing spectacles} = 350 - 100 = 250$$

S4. Ans.(a)

Sol.

$$x^2 + \frac{1}{x^2} = 98$$

Adding 2 both sides

$$x^2 + \frac{1}{x^2} + 2 = 98 + 2$$

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$$\left(x + \frac{1}{x}\right)^2 = 100$$

$$x + \frac{1}{x} = 10$$

Cubing both sides

$$\left(x + \frac{1}{x}\right)^3 = (10)^3$$

$$x^3 + \frac{1}{x^3} + 3\left(x + \frac{1}{x}\right) = 1000$$

$$x^3 + \frac{1}{x^3} = 1000 - 30 = 970$$

S5. Ans.(a)

Sol. S.P for x \Rightarrow 5000

$$\text{Profit \%} = 11\frac{1}{9}\%$$

$$= \frac{100}{9}\%$$

$$= \frac{1}{9} \rightarrow \text{Profit}$$

$$= \frac{1}{9} \rightarrow \text{C. P.}$$

$$\text{S.P} = 9 + 1 = 10$$

$$10r \rightarrow 5000$$

$$1r \rightarrow 500$$

$$9r \rightarrow 4500 \text{ Rs.}$$

$$\text{Discount \%} = \frac{500}{5000} \times 100 = 10\%$$

S6. Ans.(b)

Sol. C.P of Arun = 120

S.P of Arun & C.P of Swati

$$= 120 \times \frac{125}{100}$$

$$= 150 \text{ Rs.}$$

S.P of Divya = 198

C.P of Divya and S.P of Swati

$$= 198 \times \frac{100}{110} = 180$$

Profit of Swati

$$= \frac{180 - 150}{150} \times 100$$

$$= \frac{30}{150} \times 100 = 20\%$$

S7. Ans.(d)

Sol. $7 \sin \alpha = 24 \cos \alpha$

$$\tan = \frac{24}{7} \rightarrow \text{Perpendicular}$$

$$= \frac{7}{7} \rightarrow \text{Base}$$

$$H = \sqrt{576 + 49}$$

$$= \sqrt{625}$$

$$= 25$$

$$\cos \alpha = \frac{B}{H} = \frac{7}{25}$$

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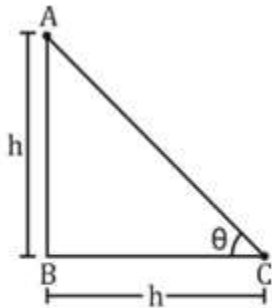
30+ TOTAL TESTS

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$$\begin{aligned} \sec \alpha &= \frac{1}{\cos \alpha} = \frac{25}{7} \\ 14 \tan \alpha - 75 \cos \alpha - 7 \sec \alpha \\ &= 14 \times \frac{24}{7} - 75 \times \frac{7}{25} - 7 \times \frac{25}{7} \\ &= 48 - 21 - 25 \\ &= 48 - 46 \\ &= 2 \end{aligned}$$

S8. Ans.(b)

Sol.



$$\tan \theta = h/h$$

$$\theta = 45^\circ$$

S9. Ans.(a)

Sol.

	Father	:	Son	
Present \Rightarrow	7	:	3	$\times 1$

After 10 year \Rightarrow	2	:	1	$\times 4$
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Present \Rightarrow	7	:	3
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After 10 year \Rightarrow	8	:	4
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$$(8 - 7)r = 10$$

$$1r = 10$$

$$\text{Present Age of father} = 7 \times 10$$

$$= 70 \text{ years}$$

S10. Ans.(b)

Sol. Ratio of speed \Rightarrow

$$10 : 15$$

$$2 : 3$$

Ratio of time \Rightarrow

$$3 : 2$$

$$(3 - 2)r \Rightarrow 12 \text{ minutes}$$

$$3r \rightarrow 36 \text{ minutes}$$

$$\text{Distance} = 10 \text{ km/hr} \times 36/60$$

$$= 6 \text{ km}$$

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S11. Ans.(c)

Sol.

Salary \rightarrow 100

What she decided to donate = 8

$$\text{She donated} = 8 \times \frac{80}{100} = 6.4$$

6.4 r \rightarrow 2240

1r \rightarrow 350

100r \rightarrow 35000 Rs

S12. Ans.(a)

Sol.

Let price of radio \rightarrow 100

Sale of radio \rightarrow 100

Total sale \Rightarrow 10000

$$\text{Reduced price} = 100 \times \frac{80}{100} = 80$$

$$\text{Increased sale} = 100 \times \frac{180}{100} = 180$$

$$\text{Total sale} = 80 \times 180 = 14400$$

$$\% \text{ increase in sale} = \frac{4400}{10000} \times 100 = 44\%$$

S13. Ans.(a)

Sol.

Price ratio \Rightarrow 100 : 107

Consumption $\left(\propto \frac{1}{\text{Price}} \right)$ Ratio

\Rightarrow 107 : 100

$$\% \text{ reduction in consumption} = \frac{7}{107} \times 100$$

$$= \frac{7}{107} \%$$

S14. Ans.(a)

Sol.

$$A = \frac{120}{100} C$$

$$C = \frac{75}{100} B$$

$$A : C \Rightarrow 6 : 5$$

$$C : B \Rightarrow 3 : 4$$

$$A : C : B \Rightarrow 18 : 15 : 20$$

$$\text{A's amount} = 4558 \times \frac{18}{53}$$

$$= 86 \times 18$$

$$= 1548$$

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S15. Ans.(d)**Sol.** Height climbed is 1st hour

$$= 192 \times 62\frac{1}{2}\% = 192 \times \frac{5}{8} = 24 \times 5 = 120$$

Remaining height = $192 - 120 = 72$

$$\text{Height climbed is second hour} = 72 \times \frac{25}{200} = 9 \text{ m}$$

S16. Ans.(c)**Sol.** Let original number 100

$$125r - 70r \Rightarrow 22$$

$$55r \Rightarrow 22$$

$$1r = \frac{2}{5}$$

$$100r = \frac{2}{5} \times 100 = 40$$

Original number = 40

S17. Ans.(a)**Sol.**

$$\frac{12}{100} \times \frac{75}{100} \times x - \frac{5x}{100} = 75$$

$$x \left(\frac{9}{100} - \frac{5}{100} \right) = 75$$

$$x \times \frac{4}{100} = 75$$

$$x = 25 \times 75 = 1875$$

S18. Ans.(d)**Sol.** Let salary of Saroj = 100

Salary of Raju = 80

Salary of Ram = 70

$$\text{Required \%} = \frac{10}{70} \times 100$$

$$= \frac{100}{7} = 14.28\%$$

S19. Ans.(b)**Sol.**

$$\text{Let traction} \rightarrow \frac{x}{y}$$


ATQ,

$$\frac{2x \times \frac{110}{100}}{3y \times \frac{70}{100}} = \frac{11}{100} \times \frac{16}{21}$$

$$\frac{2x \times 11}{3y \times 7} = \frac{11 \times 16}{100 \times 21}$$

$$\frac{x}{y} = \frac{8}{100} = \frac{2}{25}$$

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S20. Ans.(d)

Sol.

Let total no. of student in school $\rightarrow 100$

Boys = 65

Girls = 35

$$\text{Girls present} = \frac{35 \times 80}{100} = \frac{280}{10} = 28$$

Total no. of student present = 70

No. of boy's present = 70 - 28 = 42

$$\text{Fraction of boy's present} = \frac{42}{65}$$

S21. Ans.(a)

Sol.

$$\begin{aligned} & \left(\frac{2}{7} + \frac{3}{5}\right) \div \left(\frac{2}{5} + \frac{2}{7}\right) \\ & \Rightarrow \frac{31}{35} \div \frac{24}{35} \\ & \Rightarrow \frac{31}{35} \times \frac{35}{24} = \frac{31}{24} \end{aligned}$$

S22. Ans.(a)

Sol.

$$\begin{aligned} & \Rightarrow 4.6 \times 4.6 \times \frac{-1}{4} \\ & \Rightarrow -5.29 \end{aligned}$$

S23. Ans.(c)

Sol.

$$\begin{aligned} & \frac{9}{13} \times \frac{26}{18} \times \frac{52}{90} \\ & \Rightarrow \frac{26}{45} \end{aligned}$$

S24. Ans.(b)

Sol.

$$\begin{aligned} & 12 - [26 - \{2 + 5 \times 3\}] \\ & \Rightarrow 12 - [26 - 17] \\ & = 12 - 9 \\ & = 3 \end{aligned}$$


S25. Ans.(a)

Sol.

$$\begin{aligned} & \Rightarrow 10^{9+7+3-6+4-2} \\ & = 10^{15} \end{aligned}$$

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STAGE-I
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S26. Ans.(a)

Sol.

$$\begin{aligned} &\Rightarrow \frac{12}{13} \times \frac{285}{96} \times \frac{169}{171} \times \frac{485}{81} \times \frac{162}{291} \\ &\Rightarrow \frac{325}{36} = 9\frac{1}{36} \end{aligned}$$

S27. Ans.(a)

Sol.

$$\begin{aligned} &\Rightarrow \frac{[(998)^2 - (997)^2] - 45}{(98 - 97)(98 + 97)} \\ &= \frac{(998 - 997)(998 + 997) - 45}{1 \times 195} \\ &= \frac{1995 - 45}{195} \\ &= \frac{1950}{195} = 10 \end{aligned}$$

S28. Ans.(a)

Sol.

$$\begin{aligned} &\frac{83 - 8}{90} \div 7.5 \\ &= 2 \frac{321 - 3}{990} - \frac{98}{990} \\ &\Rightarrow \frac{75}{90} \times \frac{1}{7.5} \\ &= 2 \frac{318}{990} - \frac{98}{990} \\ &= \frac{1}{9} \\ &= 2 \frac{220}{990} \\ &= \frac{1}{9} \\ &= \frac{2200}{990} \\ &= \frac{1}{220} = \frac{1}{20} \\ &= 0.05 \end{aligned}$$

S29. Ans.(d)

Sol.

$$\begin{aligned} &b - [b - a - b - b + b - a + b + 2a] \\ &= b - b = 0 \end{aligned}$$

S30. Ans.(a)

Sol.

$$\begin{aligned} &\Rightarrow \frac{6^4}{6^6} \times 6^3 = 6^{(?-5)} \\ &6^1 = 6^{(?-5)} \\ &1 = ? - 5 \\ &? = 6 \end{aligned}$$

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