

Mathematics Mega Quiz For RRB NTPC (Solutions)

S1. Ans.(c)

Sol.

A's 1 day's work = (B + C)'s 1 days' work

$$(A + B)'s\ 1\ day's\ work = \frac{1}{10}$$

$$C's\ 1\ day's\ work = \frac{1}{50}$$

$$(A + B + C)'s\ day's\ work = \frac{1}{10} + \frac{1}{50} = \frac{5+1}{50}$$

$$= \frac{6}{50} = \frac{3}{25}$$

$$(A+B + C)'s\ 1\ day's\ work = \frac{3}{25}$$

$$A's\ 1\ day's\ work = \frac{3}{50}$$

$$B's\ 1\ day's\ work = \frac{1}{10} - \frac{3}{50} = \frac{5-3}{50} = \frac{2}{50} = \frac{1}{25}$$

Hence, B alone will complete the work in 25 days.

S2. Ans.(b)

Sol.

1M + 3W + 4B in 96 hrs ... (i)

2M + 8B in 80 hrs ... (ii)

Or, 1M + 4B in 160 hrs ... (iii)

2M + 3W in 120 hrs ... (iv)

From (i) and (iii), we have,

3W do the work in

$$\frac{160 \times 96}{160 - 96} = 240\ hrs \quad \dots (v)$$

From (iv) and (v), we have

2M do the work in

$$\frac{240 \times 120}{240 - 120} = 240\ hrs \quad \dots (vi)$$

$$\therefore 5M\ do\ the\ work\ in\ 240 \times \frac{2}{5} = 96\ hrs \quad \dots (vii)$$

From (ii) and (vi) we have,

$$12B\ do\ the\ work\ in\ \frac{120 \times 80}{12} = 80\ hrs \quad \dots (viii)$$

Now, from (vii) and (viii) we have,

5M + 12B do the work in

$$\frac{96 \times 80}{96 + 80} = \frac{480}{11} = 43 \frac{7}{11}\ hrs$$



S3. Ans.(a)**Sol.**

$$\text{Total work} = 40 \times 40 = 1600$$

After every 10 days, 5 men left the job

Therefore,

$$\text{Work done in first 10 days} = 40 \times 10$$

$$\text{Next 10 days} = 35 \times 10$$

$$\text{Next 10 days} = 30 \times 10$$

$$\text{Next 10 days} = 25 \times 10$$

$$\text{Next 10 days} = 20 \times 10$$

$$\text{Work done in 50 day} = 1500$$

$$\text{Remaining work} = 1600 - 1500 = 100$$

$$15 \text{ men} \times \text{No. of days} = 100$$

$$\text{No. of days} = \frac{100}{15} = 6\frac{10}{15} = 6\frac{2}{3}$$

$$\therefore \text{Total work completed in } \left(50 + 6\frac{2}{3}\right) \text{ days}$$

$$= 56\frac{2}{3} \text{ days}$$

S4. Ans.(d)**Sol.**

3 women + 18 children complete the work in 2 days. Therefore, (3×2) women + (18×2) children complete the work in 1 day

6 women + 36 children complete the work in 1 day.

$$\text{Work of 36 children for 1 day} = 1 - \frac{1}{3} = \frac{2}{3}$$

[\because work of 6 women for 1 day = $1/3$]

\therefore 36 children do $2/3$ part of the work in 1 day.

Or, 36 children can do the work in $3/2$ days.

Or, 9 children can do the work in $\left(\frac{3}{2} \times 4\right) = 6$ days

S5. Ans.(c)**Sol.**

$$A's \text{ 1 day's work} = \frac{1}{120}$$

$$B's \text{ 1 day's work} = \frac{1}{150}$$

$$(A + B)'s \text{ 1 day's work} = \frac{1}{120} + \frac{1}{150}$$

$$= \frac{5 + 4}{600} = \frac{9}{600} = \frac{3}{200}$$

$(A + B)$ work together for 20 days Hence, $(A + B)$'s 20 day's work

$$= 20 \times \frac{3}{200} = \frac{3}{10}$$

After 20 days B leaves, and A alone works for 12 days

$$\therefore A's\ 12\ day's\ work = \frac{1}{120} \times 12 = \frac{1}{10}$$

Now, after 12 days, C joins A and the work is finished in 48 days.

It means A works for 48 days more.

$$\therefore A's\ 48\ day's\ work = \frac{1}{120} \times 48 = \frac{2}{5}$$

\therefore Total work done by A and B together

$$= \frac{3}{10} + \frac{1}{10} + \frac{2}{5} = \frac{3+1+4}{10} = \frac{8}{10} = \frac{4}{5}$$

$$\therefore\ remaining\ work = 1 - \frac{4}{5} = \frac{1}{5}$$

This part of work, i.e., $\frac{1}{5}$ is done by C in 48 days

$$\therefore C's\ 48\ day's\ work = \frac{1}{5}$$

$$\therefore C's\ 1\ day's\ work = \frac{1}{5 \times 48} = \frac{1}{240}$$

Hence, C alone can finish the work in 240 days.

S6. Ans.(b)

Sol.

Let man be represented by m and woman be represented by w.

$$\therefore 2m + 1w = \frac{1}{14}$$

$$\Rightarrow 14(2m + 1w) = 1 \quad \dots (i)$$

$$\text{And } 4w + 2m = \frac{1}{8}$$

$$\text{Or, } 8(4w + 2m) = 1 \quad \dots (ii)$$

On equating Eqs. (i) and (ii), we get

$$14(2m + 1w) = 8(4w + 2m)$$

$$28m + 14w = 32w + 16m$$

$$28m - 16m = 32w - 14w \Rightarrow 12m = 18w$$

$$\therefore \frac{m}{w} = \frac{18}{12} = \frac{3}{2}$$

So, efficiency of 1 man and 1 woman is 3 : 2.

So, their wages must be in the same ratio i.e. $\frac{90}{x} = \frac{3}{2}$

[here, x = wages of a woman]

$$\therefore x = \frac{90 \times 2}{3} = \text{Rs. } 60$$

S7. Ans.(c)

Sol.

Efficiency of Heena = 5%

Efficiency of Himani = 4%


Thus, in 10 days working together they will complete only 90% of the work.

$$[(5 + 4) \times 10] = 90$$

Hence, the remaining work will be surely done by Mayuri, which is 10%.

Thus, Mayuri will get 10% of Rs. 700, which is Rs. 70.

TEST SERIES
STAGE-II



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S8. Ans.(a)

Sol.

$$\text{A's 1 day's work} = \frac{1}{12}$$

$$\text{B's 1 day's work} = \frac{1}{18}$$

Part of work done by A and B in first two days

$$= \frac{1}{12} + \frac{1}{18} = \frac{3+2}{36} = \frac{5}{36}$$

$$\text{Part of work done by A and B in 14 days} = \frac{35}{36}$$

$$\text{Remaining work} = 1 - \frac{35}{36} = \frac{1}{36}$$

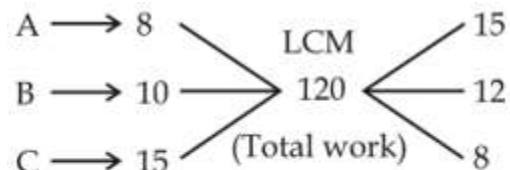
Now A will work for 15th day.

$$\text{A will do the } \frac{1}{36} \text{ work in } \frac{1}{36} \times 12 = \frac{1}{3} \text{ day.}$$

∴ Work will be done in $14\frac{1}{3}$ days.

S9. Ans.(d)

Sol.



$$2 \text{ days work of (A + B)} = 2(27) = 54$$

$$\text{Remaining work} = 120 - 54 = 66$$

$$\text{Remaining work completed by (B + C) in } \frac{66}{20} = \frac{33}{10} \text{ days}$$

$$\text{Total work completed in } 2 + \frac{33}{10} = \frac{53}{10} \text{ days}$$

S10. Ans.(b)

Sol.

$$\text{A's work for the first day} = \frac{1}{10}$$

$$\text{B's work for the second day} = \frac{1}{20}$$

$$\text{C's work for the third day} = \frac{1}{40}$$

$$\text{Work done in 3 days by them} = \frac{1}{10} + \frac{1}{20} + \frac{1}{40}$$

$$= \frac{4+2+1}{40} = \frac{7}{40}$$

Hence, $\frac{7}{40}$ part of work will be completed in 3 days.

∴ $\frac{7 \times 5}{40}$ i.e. $\frac{35}{40}$ part of work will be completed in = 3×5 or 15 days.

Remaining work

$$= 1 - \frac{35}{40} = \frac{5}{40} = \frac{1}{8}$$

Now, A will work on 16th day.

The remaining work after 16

$$= \frac{1}{8} - \frac{1}{10} = \frac{5 - 4}{40} = \frac{1}{40}$$

Again, B will work on 17th day.

∴ B completes the work in 20 days.

∴ B will complete $\frac{1}{40}$ part of work in

$$= 20 \times \frac{1}{40} = \frac{1}{2} \text{ day}$$

∴ Total time taken in completion of work

$$= 15 + 1 + \frac{1}{2} = 16\frac{1}{2} \text{ days}$$

S11. Ans.(d)

Sol.

$$\tan A - \cot A = x$$

$$\frac{\sin A}{\cos A} - \frac{\cos A}{\sin A} = x$$

$$\frac{\sin^2 A - \cos^2 A}{\sin A \cos A} = x$$

$$\frac{1 - 2\cos^2 A}{\sin A \cos A} = x$$

S12. Ans.(b)

Sol. Slope

$$= \frac{y_2 - y_1}{x_2 - x_1} = \frac{(0 - 3)}{(4 - (-1))} = \frac{-3}{5}$$

$$\text{Eqn of line} \Rightarrow (y - 0) = \frac{-3}{5} (x - 4)$$

$$5y = -3x + 12$$

$$\Rightarrow 3x + 5y = 12$$

S13. Ans.(c)

Sol.

$$\text{Effective discount} = D_1 + D_2 - \frac{D_1 \times D_2}{100}$$

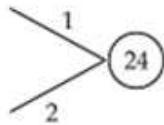
$$= 25 + 8 - \frac{25 \times 8}{100}$$

$$= 31\%$$

S14. Ans.(c)

Sol.

Prabhat --- 24 days




Santosh --- 12 days

No. of days required to complete the work together

$$= \frac{24}{1+2} = 8 \text{ days}$$

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S15. Ans.(c)

Sol.

ATQ,

$$\frac{x}{y} = \frac{y}{128} \Rightarrow y^2 = 128x \quad \dots (i)$$

And,

$$\sqrt{xy} = 16 \Rightarrow xy = 256 \quad \dots (ii)$$

From (i) & (ii)

$$x = 8 \text{ \& } y = 32$$

S16. Ans.(d)

Sol.

$$\text{Total runs made till 32 overs} = 32 \times 7.2$$

$$= 230.4 \text{ runs}$$

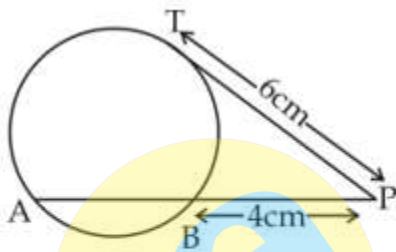
$$\text{Remaining runs to be made} = 297 - 230.4$$

$$= 66.6 \text{ runs}$$

$$\therefore \text{Required run rate} = \frac{66.6}{18} = 3.7$$

S17. Ans.(d)

Sol.



$$PT^2 = PA \times PB$$

$$36 = 4 \times PA$$

$$PA = 9 \text{ cm}$$

S18. Ans.(d)

Sol.

Let the no. be $20x$ [LCM of 4 & 5]

$$\text{Wrong multiplication} = 20x \times \frac{4}{5} = 16x$$

$$\text{Right multiplication} = 20x \times \frac{5}{4} = 25x$$

$$\% \text{ error} = \frac{25x - 16x}{25x} \times 100$$

$$= 36\%$$

S19. Ans.(c)

Sol.

in 1 hour they together travel (20 + 25) kms
towards each other

$$\Rightarrow 60 \text{ min} \rightarrow 45 \text{ km}$$

$$48 \text{ min} \rightarrow \frac{45}{60} \times 48 \text{ km}$$

$$= 36 \text{ km}$$

S20. Ans.(c)

Sol.

CP of 30 chikoo = Rs 16

SP of 30 chikoo = Rs 18

$$P = \frac{18 - 16}{16} \times 100 = 12.5\%$$

S21. Ans. (b)

Sol.

LCM of (13,14,15) = 2730

Let each vassal contains

2730

$$\text{Milk in vassal 1} = \frac{7}{13} \times 2730 = 1470$$

$$\text{Milk in vassal 2} = \frac{9}{14} \times 2730 = 1755$$

$$\text{Milk in vassal 3} = \frac{7}{15} \times 2730 = 1274$$

$$\text{Water in vassal 1} = \frac{6}{13} \times 2730 = 1260$$

$$\text{Water in vassal} = \frac{5}{14} \times 2730 = 975$$

$$\text{Water in vassal} = \frac{8}{15} \times 2730 = 1456$$

Ratio of water & milk

$$= 3691 : 4499.$$

S22. Ans. (a)

Sol.

$$\text{In 14 kg} \rightarrow \text{Iron} = 14 \times \frac{4}{7} = 8$$

$$\text{Copper} = 14 \times \frac{3}{7} = 6$$

$$\text{In 42 kg} \rightarrow \text{Iron} = 42 \times \frac{6}{7} = 36$$

$$\text{Copper} = 42 \times \frac{1}{7} = 6$$

Ratio of Iron to copper

$$= 8 + 36 : 6 + 6$$

$$= 44 : 12$$

$$= 11 : 3$$

TEST SERIES

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S23. Ans. (b)

Sol.

$$\% \text{ of Milk in 1}^{\text{st}} = \frac{5}{6} \times 100 = \frac{250\%}{3}$$

$$\% \text{ of Milk in 2}^{\text{nd}} = \frac{7}{9} \times 100 = \frac{700}{9} \%$$

Using Allegation

$$\begin{array}{r} \frac{250}{3} \quad \frac{700}{9} \\ \hline 80 \\ \frac{20}{9} : \frac{10}{3} \\ 20 : 30 \\ 2 : 3 \end{array}$$

S24. Ans. (a)

Sol.

Ratio $\rightarrow 5 : 4$

Number $\rightarrow 5x, 4x$

$$\frac{40}{100} \times 5x = 12$$

$$X = 6$$

$$\text{Second Number} = 4 \times 6 = 24$$

$$50\% \text{ of } 24 = 12$$

S25. Ans. (a)

Sol.

Ratio $\rightarrow 3 : 2 : 1$

Let Share of each men women & boy

$$\Rightarrow 3x, 2x, x$$

$$3 \times x + 4 \times 2x + 6x = 1104$$

$$23x = 1104, x = 48$$

S26. Ans. (d)

Sol.

Son : Father = 1 : 5

Father : Mother = 5 : 4

Mother : Father = 4 : 5

Son : Father : Mother

$$= 5 : 25 : 20$$

$$= 1 : 5 : 4$$

Let present ages of son, Father & Mother

$$= x, 5x, 4x$$

$$\frac{x+2}{4x+2} = \frac{3}{10}$$

$$10x + 20 = 12x + 6$$

$$2x = 14$$

$$x = 7$$

Present age of father

$$= 5 \times 7 = 35 \text{ years}$$

S27. Ans. (d)

Sol.

$$3 \text{ CA} = 2 \text{ MBA}$$

$$\text{MBA} : \text{CA} = 3 : 2$$

$$3 \text{ Eng} = 2 \text{ Ca}$$

$$\text{C.A. Eng} = 3 : 2$$

$$\text{MBA} : \text{CA} : \text{Eng}$$

$$\text{Let} = 8 : 6 : 4$$

Each MBA, CA & Eng gets

$$= 9x, 6x, 4x$$

$$4 \times 4x + 3 \times 9x + 3 \times 6x = 3660$$

$$16x + 27x + 18x = 3660$$

$$61x = 3660$$

$$x = 60$$

Share of an MBA

$$= 9 \times 60$$

$$= 540$$

S28. Ans.(b)

Sol. ATQ,

$$\text{time} = \frac{400}{5}$$

$$= 80 \text{ seconds}$$

S29. Ans. (c)

Sol. Let no. of boys & girls

$$\Rightarrow x, y$$

$$y - x = 15$$

$$\frac{110y}{100} - \frac{116}{100} = 9$$

$$1.1y - 1.16x = 9$$

$$1.1y - 1.1x = 16.5$$

$$\frac{0.06x}{0.06} = \frac{-7.5}{0.06}$$

$$x = \frac{7.50}{6}$$

$$= 125$$

$$y = 140$$

$$\text{Total student} = 125 + 140 = 265$$

S30. Ans. (c)

Sol.

Zinc : Copper

$$= 9 : 11$$

$$9r \rightarrow 28 : 8 \text{ kg}$$

$$R \rightarrow 3.2 \text{ kg}$$

$$\text{Mixture} = 20 r$$

$$= 20 \times 3.2 = 64 \text{ kg}$$

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