Mathematics Mega Quiz For RRB NTPC (Solutions)

S1. Ans.(d)
Sol. Distance covered by car in 2 hours

$= \frac{300 \times 40}{100} = 120$ km

Remaining distance = 180 km

Remaining time = 2h

Required speed $= \frac{180}{2} = 90$ km/h

Speed of car $= \frac{120}{2} = 60$ km/hr

Required increase in speed = 90 − 60 = 30 km/h

S2. Ans.(c)
Sol. Distance covered by Atlas cycling in $1\frac{1}{4}$ hr

$= 12 + 12 \times \frac{1}{4} = 15$ km

Elder brother catch the boy = in $2\frac{1}{4}$ hr

Now, according to question

$(\text{Bajaj Scooter})_{Speed} - (\text{Atlas Cycling})_{Speed} = \frac{15}{2\frac{1}{4}}$

$(\text{Bajaj Scooter})_{speed} = \frac{15 \times 4}{9} + 12$

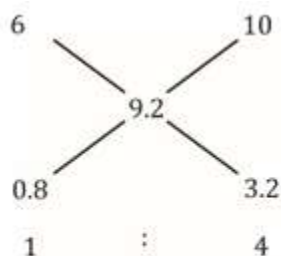$= \frac{20}{3} + 12 = \frac{56}{3} = 18\frac{2}{3}$

S3. Ans.(c)
Sol. Required equation,
x + 182 × 13 = 2402
x = 2402 − 2366 ⇒ x = 36

S4. Ans.(c)
Sol.

$1000 \times \frac{1}{5} = 200$ & 800.

S5. Ans.(b)
Sol. Zaffer, Tahir and Jamila together can finish the work in 4 days.
Zaffer and Tahir together can do it in 24/5 days
Tahir and Jamila together can do it in 8 days. Therefore, zaffer alone can complete the work in

$= \frac{XY}{Y-X}$ days $= \left(\frac{8 \times 4}{8-4}\right)$ days

[Here, X = 4 and Y = 8]

= 8 days.

So, Tahir alone can complete the work in

$= \left(\frac{XY}{Y-X}\right)$ days $= \left(\frac{\frac{24}{5} \times 8}{8-\frac{24}{5}}\right)$ days

$\left[\text{Here}, Y = 8 \text{ and } X = \frac{24}{5}\right]$

= 12 days.

S6. Ans.(b)
Sol.

Here, a = 4, b = 6, n = 20, c = 6 and d = 11

If a men or b women complete a work
in n days then time taken by c men and
d women to complete the same work

$= \left(\frac{nab}{bc+ad}\right)$ days $= \left(\frac{20 \times 4 \times 6}{6 \times 6 + 4 \times 11}\right)$ days

= 6 days.

When work is double than no. of days= 12 days.

S7. Ans.(b)
Sol. Suppose, C alone can do this work in x days

∴ C will do $\frac{1}{x}$ work in 1 day

Now, work done by (B + C) in 1 day $= \frac{1}{16}$

∴ Work done by B in 1 day $= \left(\frac{1}{16} - \frac{1}{x}\right)$

And, work done by (A + B) in 1 day $= \frac{1}{12}$

∴ Work done by A in 1 day $= \frac{1}{12} - \left(\frac{1}{16} - \frac{1}{x}\right)$

$= \frac{1}{48} + \frac{1}{x}$

As per the question,

Work done by A in 5 days + work done by B in 7 days + work done by C in 13 days = whole work

∴ $5\left(\frac{1}{48} + \frac{1}{x}\right) + 7\left(\frac{1}{16} - \frac{1}{x}\right) + \frac{13}{x} = 1$

Or, $\frac{5}{48} + \frac{5}{x} + \frac{7}{16} - \frac{7}{x} + \frac{13}{x} = 1$

Or, $\frac{26}{48} + \frac{11}{x} = 1$, or, $\frac{11}{x} = 1 - \frac{26}{48}$

Or, $\frac{11}{x} = \frac{22}{48}$, or, x = 24

∴ C alone would complete this work in 24 days.

S8. Ans.(d)
Sol. Since 100 Men can complete one third work in 10 days therefore one third work is 100 × 10 Man days therefore total work is 100 × 10 × 3 Man days. Also 100 Men worked for first 10 days, 160 Men worked from beginning of 11th day to end of 18th day i.e. for 8 days. Now 18 days are already over and 5 more days are required to finish the work in total 10 + 13 i.e. 23 days. Let us assume X men will be discharged at the end of 18th day. Hence (160 – X) Men will work for another 5 days.

100 × 10 + 160 × 8 + (160 – X) × 5 = 100 × 10 × 3

⇒ x = 16 men

S9. Ans.(c)
Sol. Suppose, there were x packages in the Maruti van before deliver.

∴ After first deliver, the number of packages in the Maruti van

$$= x - \frac{2}{5}x = \frac{3}{5}x$$

After second delivery, the number of packages in the Maruti van

$$= \frac{3}{5}x - 3 = \frac{3x - 15}{5}$$

$$\therefore \frac{3x - 15}{5} = \frac{x}{2} \text{(Given)}$$

⇒ x = 30.

S10. Ans.(b)
Sol.

Average score before 17th innings

= 85 - 3 × 17 = 34

∴ Average score after 17th innings

= 34 + 3 = 37.

S11. Ans.(c)
Sol.

Number 1 = 17k + 13
Number 2 = 17k + 11
Sum of numbers ⇒ 17k + 13 + 17k + 11
= 34k + 24

$$\frac{34k + 24}{17} \Rightarrow \frac{34k}{17} \quad + \quad \frac{24}{17}$$

↓Remainder 0   ↓Remainder 7

0   7

S12. Ans.(d)
Sol.

$$\frac{3x - 2y}{2x + 3y} = \frac{5}{6}$$

18x – 12y = 10x + 15y
8x = 27y
x : y = 27 : 8
x → 27
y → 8

$$\Rightarrow \left(\frac{\sqrt[8]{x} + \sqrt[8]{y}}{\sqrt[8]{x} - \sqrt[8]{y}}\right)^2$$

$$\Rightarrow \left(\frac{\sqrt[8]{27} + \sqrt[8]{8}}{\sqrt[8]{27} - \sqrt[8]{8}}\right)^2$$

$$= \left(\frac{3+2}{3-2}\right)^2 = (5)^2 = 25$$

S13. Ans.(a)
Sol.
$A = B \times \frac{140}{100}$
$A : B = 7 : 5$
$B = C \times \frac{80}{100}$
$B : C = 4 : 5$
$A : B : C = 28 : 20 : 25$
$A : C = 28 : 25$

S14. Ans.(c)
Sol.

	Old		New
Price →	100	:	120
	5	:	6

Consumption

$\left(\propto \frac{1}{price}\right) \rightarrow$ 6 : 5

Reduction is Consumption = 6 – 5 = 1
Original Consumption = 6
Ratio = 1 : 6

S15. Ans.(a)
Sol. Let total length of cloth ⇒ 100 m
Let price of Per meter = 10 Rs.
Total C.P = 100 × 10= 1000 Rs.
S.P of 50 Meters = 500 × $\frac{120}{100}$= 600 Rs.
S.P of 25 meters = 250 × $\frac{80}{100}$= 200 Rs.
S.P of 25 meters = 25 × 10 = 250 Rs.
Total S.P = 600 + 200 + 250 = 1050 Rs.
Profit % = $\frac{50}{1000}$ × 100= 5%

S16. Ans.(c)
Sol. C.P → x
Profit % → 13%
S.P → 791000 Rs.
$x \times \frac{113}{100} \Rightarrow$ 791000 Rs.
x = 700000 Rs.
Profit = 791000 – 700000 = 91000 Rs.

S17. Ans.(b)
Sol.

Profit on TV = $2000 \times \frac{20}{100}$ = 400 Rs.

Loss on Radio = $750 \times \frac{5}{100}$ = 37.5 Rs.

Total Gain = 400 – 37.5 = 362.5

S18. Ans.(d)
Sol.

$\sin \theta = \dfrac{5}{13} \to \dfrac{P}{H}$

$B = \sqrt{169 - 25} = 12$

$\cot \theta = \dfrac{B}{P} = \dfrac{12}{5}$

$\tan \theta = \dfrac{5}{12}$

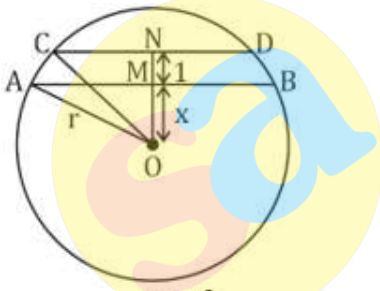$\sqrt{\cot \theta + \tan \theta} = \sqrt{\dfrac{12}{5} + \dfrac{5}{12}}$

$= \sqrt{\dfrac{144 + 25}{60}}$

$= \sqrt{\dfrac{169}{60}}$

$= \dfrac{13}{2\sqrt{15}}$

S19. Ans.(a)
Sol. In ∆AOM

$r^2 = x^2 + \left(\dfrac{AB}{2}\right)^2$

$r^2 = x^2 + 16$ ... (i)

In ∆OCN

$r^2 = (x + 1)^2 + \left(\dfrac{6}{2}\right)^2$

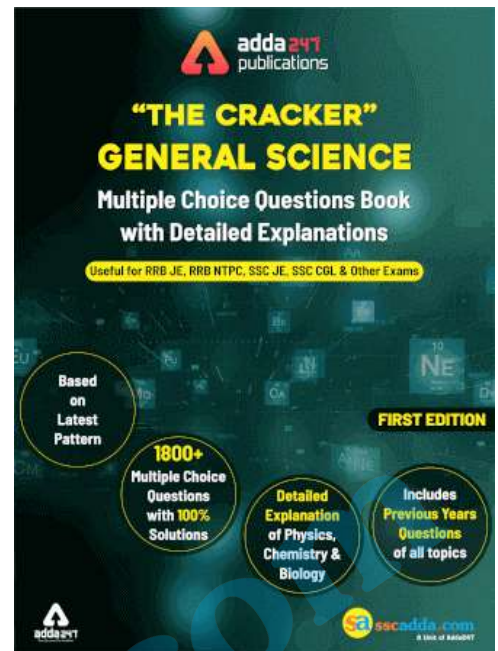$r^2 = (x + 1)^2 + 9$ ... (ii)

$x^2 + 16 = x^2 + 1 + 2x + 9$

$x = 3$

ON = 4, CN = 3

$r^2 = 16 + 9$

$r^2 = 25$

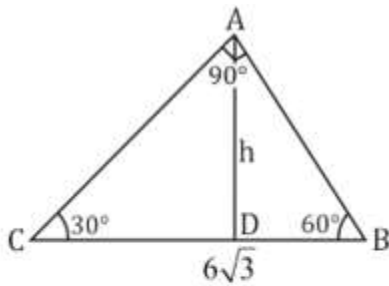r = 5 cm

S20. Ans.(b)

Sol.

$\sin 30° = \dfrac{AB}{BC}$

$\dfrac{1}{2} = \dfrac{AB}{6\sqrt{3}}$

$AB = 3\sqrt{3}$ cm

$\sin 60° = \dfrac{AD}{AB}$

$\dfrac{\sqrt{3}}{2} = \dfrac{AD}{3\sqrt{3}}$

$AD = 9/2 = 4.5$ cm

S21. Ans.(a)

Sol.

+10% − 5% → 1000 Rs.

5% → 1000 Rs.

1% → 200 Rs.

100% → 20,000 Rs.

S22. Ans.(b)

Sol.

Using short cut

Loss % = $\left(\dfrac{x}{10}\right)^2$

= $(2.5)^2$

= 6.25%

C. P = $240 \times \dfrac{100}{93.75}$ = 256

S.P = 240

Loss = Rs. 16

S23. Ans.(d)

Sol.

Shortcut = $\left(\dfrac{x}{10}\right)^2$

= 6.25%

= $6\dfrac{1}{4}$%

S24. Ans.(a)

Sol.

$C.P \times \frac{80}{100} = 480$

$C.P = 600$

S.P that he want to sell $= 600 \times \frac{120}{100}$

$= 720$ Rs.

S25. Ans.(c)

Sol.

$+5\% - (-5\%) \Rightarrow Rs. 5$

$10\% = Rs. 5$

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

$100\% = Rs. 50$

S26. Ans.(c)

Sol.

$C.P \times \frac{91}{100} = 105$

$C.P = \frac{10500}{91}$

$S.P = \frac{10500}{91} \times \frac{130}{100}$

$= 150$ Rs.

S27. Ans.(a)

Sol.

Let $C.P \rightarrow 100$

C.P	S.P
100	90
100	112.5

$22.5 \rightarrow Rs. 9$

$1r \rightarrow \frac{9}{22.5}$

$100r \rightarrow \frac{9}{22.5} \times 100$

$= \frac{9}{225} \times 1000$

$= 40$ Rs.

S28. Ans.(d)

Sol.

$5\% \Rightarrow Rs. 50$

$1\% \Rightarrow Rs. 10$

$100\% \Rightarrow Rs. 1000$

S29. Ans.(c)
Sol.
Single discount = −20 − 10 + 2
= −28%
S.P = $500 \times \frac{72}{100}$
= 360 Rs.

S30. Ans.(d)
Sol.
P = 10 − 10 − 1
= −1%
⇒ loss → 1%