S1. Ans.(c)
Sol.
Let Husband wife meet after x minutes

Distance covered by Pradeep in x minutes$= \frac{4500}{60}$x

Distance covered by his wife in x minutes$= \frac{3750}{60}$x

$= \frac{450}{6}x + \frac{375}{6}x = 726$

$\frac{825}{6}x = 726$

$x = \frac{4356}{825}$

= 5.28 minutes

S2. Ans.(b)
Sol. Let sped of boat be x km/hr

Speed of stream be y

Speed upstream = x – y

Speed downstream = x + y

$\frac{24}{x-y} + \frac{28}{x+y} = 6 \ldots (i)$

$\frac{30}{x-y} + \frac{21}{x+y} = 6\frac{1}{2} \ldots (ii)$

Solving (i) & (ii) we get

x = 10 km/hr

y = 4 km/hr

S3. Ans.(c)
Sol. Distance travelled by train travelling at 100 km/hr in 45 minutes
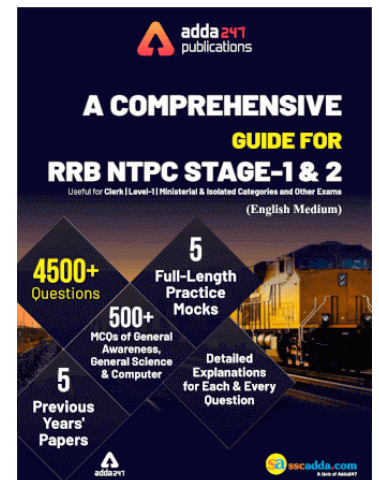
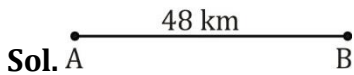$\Rightarrow \frac{45 \times 100}{60}$

= 75 km

Trains will meet after

$= \frac{75}{136 - 100}$

$= \frac{75}{36} = 2.083$

Distance from Mumbai = 2.083 × 136

= 283. 33 km

S4. Ans.(b)

Sol.
A •————48 km————• B

Speed of current = 6 km/hr
Let speed of boat be x km/hr
$$\frac{48}{x-6} + \frac{48}{x+6} = 6$$
Using option
x = 16 km/hr satisfies

S5. Ans.(a)
Sol. 550 m = speed of train × 5 sec
110 m/s = speed
100 = 114 × time
Time = 0.87 sec
Less than 1 sec.

S6. Ans.(a)
Sol. Clock gains
15 minutes in 24 hours
Clock gains in 1 hour $\Rightarrow \dfrac{15}{24}$
In 16 hours it will gain $= \dfrac{15}{24} \times 16$
= 10 minutes
Time shown by clock at 4.00 AM = 4 : 10 AM

S7. Ans.(b)
Sol.
$$S = \frac{D}{Time}$$
$$= \frac{80}{\frac{60}{40} + \frac{20}{20}}$$
$$= \frac{80}{1.5 + 1}$$
$$= \frac{80}{2.5}$$
$$= \frac{800}{25} = 32 \text{ km/hr}$$

S8. Ans.(d)
Sol.
$$Average\ speed = \frac{500}{5\frac{1}{2} + 4\frac{2}{3}}$$
$$= \frac{500}{\frac{11}{2} + \frac{14}{3}}$$
$$= \frac{500 \times 6}{33 + 38}$$
$$= \frac{3000}{71}$$
$$= 49.18 \cong 50$$

S9. Ans.(c)
Sol. If A runs 400 m
B runs 395 m
If B runs 400 m
C runs 396 m
If D runs 400 m
C covers 384 m
If B covers 395 m, then C will cover $= \frac{396}{400} \times 395 = 391.05$ m
If C covers 391.05 m then D will cover $= \frac{400}{384} \times 391.05 = 407.34$ m
Thus, if A and D run 400m, then D wins by 7.3 m.

S10. Ans.(a)
Sol.
Train   Car
240   210   = 8 h 40 min.
180   270   = 9 h
To travel extra 60 km by car increase in time = 20 min
So, travel extra 240 km by car increase in time = 80 min
∴ 450 km by car in = 8 h 40 min + 80 min = 10 h
Speed of car = 450/10 = 45 km/h

S11. Ans.(c)
Sol. Let Husband wife meet after x minutes
Distance covered by Pradeep in x minutes $= \frac{4500}{60}x$
Distance covered by his wife in x minutes $= \frac{3750}{60}x$
$= \frac{450}{6}x + \frac{375}{6}x = 726$
$\frac{825}{6}x = 726$
$x = \frac{4356}{825}$
$= 5.28$ minutes

S12. Ans.(a)
Sol. Let sped of boat be x km/hr
Speed of stream be y
Speed upstream = x – y
Speed downstream = x + y
$\frac{24}{x-y} + \frac{28}{x+y} = 6$ ... (i)
$\frac{30}{x-y} + \frac{21}{x+y} = 6\frac{1}{2}$ ... (ii)
Solving (i) & (ii) we get
x = 10 km/hr
y = 4 km/hr

S13. Ans.(c)
Sol. Distance travelled by train travelling at 100 km/hr in 45 minutes

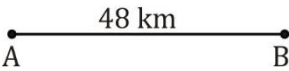$$\Rightarrow \frac{45 \times 100}{60}$$

= 75 km
Trains will meet after

$$= \frac{75}{136 - 100}$$

$$= \frac{75}{36}$$

= 2.083
Distance from Mumbai = 2.083 × 136
= 283. 33 km

S14. Ans.(b)

A •————— 48 km —————• B

Sol.
Speed of current = 6 km/hr
Let speed of boat be x km/hr

$$\frac{48}{x - 6} + \frac{48}{x + 6} = 6$$

Using option
x = 16 km/hr satisfies

S15. Ans.(a)
Sol. 550 m = speed of train × 5 sec
110 m/s = speed
100 = 114 × time
Time = 0.87 sec
Less than 1 sec.

S16. Ans.(a)
Sol. Clock gains
15 minutes in 24 hours
Clock gains in 1 hour $\Rightarrow \frac{15}{24}$
In 16 hours it will gain $= \frac{15}{24} \times 16$
= 10 minutes
Time shown by clock at 4.00 AM = 4 : 10 AM

S17. Ans.(b)
Sol. $S = \frac{D}{\text{Time}}$

$$= \frac{80}{\frac{60}{40} + \frac{20}{20}}$$

$$= \frac{80}{1.5 + 1}$$

$$= \frac{80}{2.5}$$

$$= \frac{800}{25} = 32 \text{ km/hr}$$

S18. Ans.(d)

Sol. Average speed $= \frac{500}{5\frac{1}{2} + 4\frac{2}{3}}$

$= \frac{500}{\frac{11}{2} + \frac{14}{3}} = \frac{500 \times 6}{33 + 38}$

$= \frac{3000}{71} = 49.18 \cong 50$

S19. Ans.(c)

Sol. If A runs 400 m

B runs 395 m

If B runs 400 m

C runs 396 m

If D runs 400 m

C covers 384 m

If B covers 395 m, then C will cover $= \frac{396}{400} \times 395 = 391.05$ m

If C covers 391.05 m then D will cover $= \frac{400}{384} \times 391.05 = 407.34$ m

Thus, if A and D run 400m, then D wins by 7.3 m.

S20. Ans.(a)

Sol.

Train   Car

240   210   = 8 h 40 min.

180   270   = 9 h

To travel extra 60 km by car increase in time = 20 min

So, travel extra 240 km by car increase in time = 80 min

∴ 450 km by car in = 8 h 40 min + 80 min = 10 h

Speed of car = 450/10 = 45 km/h

S21. Ans.(c)

Sol. Let the number be x.

Then, $\frac{1}{8}$x = 41.5 ⇒ x = 41.5 × 8 = 332.

∴ 69% of 332 = $\left(\frac{69}{100} \times 332\right)$ = 229.08.

S22. Ans.(a)

Sol. Price of 5 pairs when purchased separately = Rs. 5.

Price of 5 pairs package = Rs. 3.40.

Difference in price = Rs. (5 – 3.40) = Rs. 1.60.

∴ Required percentage = $\left(\frac{1.6}{5} \times 100\right)$% = 32%.

S23. Ans.(b)

Sol. Number of rolls sold by noon = $\frac{1}{2}$ of 40 dozen = 20 dozen.

Number of rolls sold between noon and closing time = 60% of 20 dozen

= $\left(\frac{60}{100} \times 20\right)$ dozen = 12 dozen.

Number of rolls left unsold = [40 – (20 + 12)] dozen = 8 dozen.

S24. Ans.(a)
Sol. Total number of students = (100 + 75) = 175.
Number of students passed = 75% of 100 + 60% of 75 = 75 + 45 = 120.
$\therefore$ Pass percentage = $\left(\frac{120}{175} \times 100\right)\% = \left(\frac{480}{7}\right)\% = 68\frac{4}{7}\%$.

S25. Ans.(a)
Sol. Rebate = 6% of Rs. 6650 = Rs. $\left(\frac{6}{100} \times 6650\right)$ = Rs. 399.
Sales tax = 10% of Rs. (6650 – 399) = Rs. $\left(\frac{10}{100} \times 6251\right)$ = Rs. 625.10
$\therefore$ Final amount = Rs. (6251 + 625.10) = Rs. 6876.10.

S26. Ans.(c)
Sol. Total marks obtained by the student = 55% of 800
= $\left(\frac{55}{100} \times 800\right)$ = 440
$\therefore$ Marks scored in English
= 15% of 440 = $\left(\frac{15}{100} \times 440\right)$ = 66.

S27. Ans.(c)
Sol. Let the number be x.
Then, 40% of 60% of $\frac{3}{5}$ of x = 504
$\Rightarrow \left(\frac{40}{100} \times \frac{60}{100} \times \frac{3}{5} \times x\right) = 504$
$\Rightarrow \frac{18}{125}x = 504 \Rightarrow x = \frac{504 \times 125}{18} = 3500$
$\therefore$ 25% of $\frac{2}{5}$ of 3500 = $\left(\frac{25}{100} \times \frac{2}{5} \times 3500\right)$ = 350.

S28. Ans.(d)
Sol. Let the number be x.
Then, 35% of x = 175
$\Leftrightarrow \left(\frac{35}{100} \times x\right) = 175 \Leftrightarrow x = \left(\frac{175 \times 100}{35}\right) = 500$.
Now, let y% of 175 = 500.
Then, $\left(\frac{y}{100} \times 175\right) = 500 \Leftrightarrow y = \left(\frac{500 \times 100}{175}\right) = \frac{2000}{7} = 285\frac{5}{7}$.

S29. Ans.(b)
Sol. Marks secured by X = 58% of 700 = $\left(\frac{58}{100} \times 700\right)$ = 406.
Marks secured by Y = (406 – 105) = 301.
$\therefore$ Required percentage = $\left(\frac{301}{700} \times 100\right)\%$ = 43%.

S30. Ans.(d)
Sol. Let the number be x.
Then,
54% of x – 26% of x = 22526
$\Rightarrow \frac{54}{100}x - \frac{26}{100}x = 22526 \Rightarrow \frac{28}{100}x = 22526$
$\Rightarrow x = \left(\frac{22526 \times 100}{28}\right) = 80450$
$\therefore$ 66% of 80450 = $\left(\frac{66}{100} \times 80450\right)$ = 53097.