S1. Ans.(b)
Sol.
(i) $x^2 = 529 - 385$
$x^2 = 144$
$x = +12, -12$
(ii) $2y^2 + 51y + 324 = 0$
$2y^2 + 24y + 27y + 324 = 0$
$y = -12, -\frac{27}{2}$
$\therefore x \geq y$

S2. Ans.(c)
Sol.
(i) $3x^2 - 58x + 280 = 0$
$3x^2 - 28x - 30x + 280 = 0$
$x(3x - 28) - 10(3x - 28) = 0$
$x = 10, \frac{28}{3}$
(ii) $3y^2 - 67y + 374 = 0$
$3y^2 - 33y - 34y + 374 = 0$
$y = 11, \frac{34}{3}$
$\therefore y > x$

S3. Ans.(e)
Sol.
(i) $25x^2 - 25x - 176 = 0$
$25x^2 - 80x + 55x - 176 = 0$
$x = \frac{-11}{5}, \frac{+16}{5}$
(ii) $25y^2 - 55y + 18 = 0$
$25y^2 - 10y - 45y + 18 = 0$
$y = \frac{2}{5}, \frac{9}{5}$
$\therefore$ No relation

S4. Ans.(e)
Sol.
(i) $20x^2 - 41x + 20 = 0$
$20x^2 - 25x - 16x + 20 = 0$
$x = \frac{5}{4}, \frac{4}{5}$
(ii) $16y^2 - 22y + 7 = 0$
$16y^2 - 14y - 8y + 7 = 0$
$y = \frac{1}{2}, \frac{7}{8}$
$\therefore$ No relation

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S5. Ans.(c)
Sol.
(i) $2x - y = \frac{31}{15}$
(ii) $3x + 5y = 20$
Solving (i) and (ii)
$x = \frac{7}{3}, y = \frac{13}{5}$
$\therefore y > x$

S6. Ans.(a)
Sol. Area of rectangular field $= \frac{\text{Total sum}}{\text{Amount/m}^2}$

$= \frac{1000}{0.25} = 4000 \text{ m}^2$

$\therefore$ Length of rectangular field $= \frac{\text{Area}}{\text{Breadth}} = \frac{4000}{50} = 80$ cm

Since, the length is increased by 20 m

$\therefore$ New length $= 80 + 20 = 100$ m

New area $= 100 \times 50 = 5000 \text{ m}^2$

New Expenditure$= 5000 \times \frac{25}{100} = 1250$ Rs.

S7. Ans(c)
Sol. Three years SI on 15% = 15×3=45%

Equivalent two years CI on 8 %= $8 + 8 + \frac{8 \times 8}{100} = 16.64\%$

Equivalent two years CI on 20% = $20 + 20 + \frac{20 \times 20}{100} = 44\%$

ATQ –

$\frac{44(2P+8000)}{100} - \left(\frac{45P}{100} + \frac{16.64(P+8000)}{100} \right) = 5352$

88P + 3520 - .45P – .1664P – 1331.2 = 5352

2636P = 3163.2

$P = \frac{3163.2}{.2636} = 12000 \, Rs.$

Suresh borrowed = 12000×2+8000 = 32000 Rs

S8. Ans.(c)
Sol. Lets speed of train P, Q and R be S_1, S_2 and S_3 respectively

Speed of train P (S_1) $= \frac{180}{\frac{27}{4}} \text{ m/s} = \frac{80}{3} \frac{m}{s}$

Speed of train Q (S_2)

$\frac{80}{3} + S_2 = \frac{240+180}{9}$

$S_2 = \frac{420}{9} - \frac{80}{3}$

$S_2 = 20$ m/s

Speed of train R (S_3)

$\frac{80}{3} - S_3 = \frac{210+180}{39}$

$S_3 = \frac{80}{3} - 10$

$S_3 = \frac{50}{3}$ m/s

Lets required time be T sec

Required time $= 20 + \frac{50}{3}$

$= \frac{240+210}{T}$

$\frac{110}{3} = \frac{450}{T}$

$T = \frac{450 \times 3}{110}$

T = $12\frac{3}{11}$ sec

S9. Ans.(e)

Sol. A got 40% of profit

B & C got 30% each

So investment ratio of A, B and C is 4 : 3 : 3

Now,

They earn 10% profit

$\Rightarrow \frac{10x \times 10}{100} = x$

If they earn 15% profit

$= \frac{10x \times 15}{100} = \frac{3}{2}x$

A got 900 Rs. more

$\Rightarrow \frac{3}{2}x \times \frac{40}{100} - \frac{x \times 40}{100} = 900$

$\Rightarrow x = 4500$

Total investment = 45000

B's investment $= \frac{45000 \times 3}{10} = 13500$

S10. Ans.(a)

Sol. Speed of tractor $= \frac{360}{12} = 30$ km/hr

Speed of jeep $= \frac{250}{100} \times 75$ km/hr

∵ Ratio of speed of Car, Jeep, and Tractor is 3 : 5 : 2

∴ Speed of car $= 3 \times 15 = 45$ km/hr

Required average speed of Car and Jeep $= \frac{75+45}{2} = 60$ km/hr

S11. Ans.(a)

Sol. $\frac{53}{3} - \frac{41}{5} - \frac{48}{5} + ? = \frac{8}{15}$

$? = \frac{8}{15} - \frac{53}{3} + \frac{89}{5}$

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

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S12. Ans.(b)
Sol. 13 − 34 + 15 = ?
? = −6

S13. Ans.(c)
Sol. $\frac{25}{100} \times 650 - \frac{65}{100} \times 250 = ?\ -5$
? = 5

S14. Ans.(c)
Sol. 36 × 36 + 144 − 30 = ?
1296 + 144 − 30 = ?
? = 1410

S15. Ans.(b)
Sol. 18 − 12 × 16 × $\frac{1}{24}$ + 5 = ?
18 − 8 + 5 = ?
? = 15

S16. Ans.(d)
Sol. Number of Accord cars sold by dealers D and E together
$= \left(\frac{6}{21} \times \frac{14}{100} + \frac{3}{14} \times \frac{21}{100}\right) \times 12000$ = 480 + 540 = 1020

Number of City cars sold by dealers B and F together
$= \left(\frac{3}{10} \times \frac{15}{100} + \frac{6}{15} \times \frac{20}{100}\right) \times 12000$ = 540 + 960 = 1500

Required Difference = 1500 - 1020 = 480

S17. Ans.(b)
Sol. Number of Accord and Civic cars sold by dealer A together = $\frac{6}{9}$ of 12% = 8%

Number of Civic and City cars sold by dealer D together = $\frac{15}{21}$ of 14% = 10%

Required Percentage = $\frac{8}{10} \times 100$ = 80%

S18. Ans.(c)
Sol. Total number of Civic cars sold by dealers A, B, D and E together
$= \left(\frac{2}{9} \times \frac{12}{100} + \frac{4}{10} \times \frac{15}{100} + \frac{8}{21} \times \frac{14}{100} + \frac{6}{14} \times \frac{21}{100}\right) \times 12000$ = 320 + 720 + 640 + 1080 = 2760

Required Average = $\frac{2760}{4}$ = 690

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S19. Ans.(b)

Sol. Civic and City cars sold together by dealer B = $\frac{7}{10}$ of 15% = $\frac{21}{2}$%

Civic and City cars sold together by dealer E = $\frac{11}{14}$ of 21% = $\frac{33}{2}$%

Required Ratio = $\frac{21}{2}$% : $\frac{33}{2}$% = 7 : 11

S20. Ans.(e)

Sol. Percentage of City cars sold by:

Dealer A = $\frac{3}{9}$ of 12% = 4%
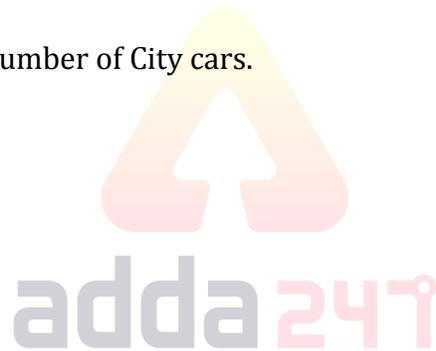
Dealer B = $\frac{3}{10}$ of 15% = 4.5%

Dealer C = $\frac{4}{15}$ of 18% = 4.8%

Dealer D = $\frac{7}{21}$ of 14% = 4.67%

Dealer E = $\frac{5}{14}$ of 21% = 7.5%

Dealer F = $\frac{6}{15}$ of 20% = 8%

Hence, dealer A sold the minimum number of City cars.

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