S1. Ans.(c)
Sol.
$x^2 + 3x - 18$
$\Rightarrow x^2 + 6x - 3x - 18$
$\Rightarrow x(x + 6) - 3(x + 6)$
$\Rightarrow (x - 3)(x + 6)$

S2. Ans.(d)
Sol.
Time = Distance/Relative speed
$\frac{44}{60} = \frac{x}{39}$
$\frac{44 \times 39}{60} = x$
28.6 km = x

S3. Ans.(a)
Sol.
x^2 – (sum of roots) x + product of the roots = 0
$x^2 - (-7)x + 12 = 0$
$x^2 + 7x + 12 = 0$

S4. Ans.(d)
Sol.
Effective discount
= –20 – 10 + 2
= 28%

S5. Ans.(b)
Sol.
2530/1430
= 23/13

S6. Ans.(b)
Sol.
$5x - 3 \geq 3 + x/2$
$10x - 6 \geq 6 + x$
$9x \geq 12$
$x \geq 4/3$

$x \geq 1.33$ ...(i)
$4x - 2 \leq 6 + x$
$3x \leq 8$
$x \leq 8/3$
$x \leq 2.66$ ...(ii)
from (i) & (ii)
$1.33 \leq x \leq 2.66$
$x = 2$

S7. Ans.(a)
Sol.
Ist term = 32
Last term = –43
$S_n = \frac{n}{2}[1\text{st term} + \text{last term}]$
$-88 = \frac{n}{2}[32 - 43]$
$-176 = n[-11]$
n = 16

S8. Ans.(a)
Sol.
If difference of S.I & C.I for 2 years is given than we can use the following formula
$C.I - S.I = P\left(\frac{R}{100}\right)^2$
$81 = \frac{P \times 18 \times 18}{10000}$
P = Rs 2500

S9. Ans.(a)
Sol.
Points (12, –1) & (–3, 4)
if the line segment joining above points is divided by y axis then x = 0
Let it divides it is the ratio m : n
$x = \frac{mx^2 + nx_1}{m + n}$
$0 = \frac{m(-3) + 12n}{m + n}$
3m = 12n
m : n = 4 : 1

S10. Ans.(b)
Sol.
Slope of line passing through (4, 3) (y, 0) is
$m_1 = \frac{y_2 - y_1}{x_2 - x_1}$
$= \frac{0 - 3}{y - 4}$
$= \frac{-3}{y - 4}$
Slope of line passing through (–1, –2) (3, 0) is
$m_2 = \frac{y_2 - y_1}{x_2 - x_1}$
$= \frac{0 - (-2)}{3 - (-1)}$
$= \frac{2}{4}$
If two lines are parallel then, there slopes we equal
$m_1 = m_2$
$\frac{-3}{y - 4} = \frac{1}{2}$
$-6 = y - 4$
$y = -2$

S11. Ans.(c)
Sol.
Ratio of coin ⇒ 2 : 3 : 5
Let no. of coins are 2x, 3x & 5x
ATQ,
$2x \times 1 + 3x \times \frac{1}{2} + \frac{5x}{10} = 20$
$20x + 15x + 5x = 200$
$x = 5$
No. of 50 paise coin = 3 × 5 = 15

S12. Ans.(a)
Sol.
Let Average weight of Boys be x
Using Allegation

Girls		Boys
62		x
	66.5	

$$\frac{x-66.5}{4.5} = \frac{33}{27}$$

$x - 66.5 = 5.5$

$x = 72$ kg

S13. Ans.(c)

Sol.

$\Rightarrow \frac{116}{100}$

$\Rightarrow \frac{58}{50}$

$\Rightarrow \frac{29}{25}$ → Final Number

→ Original Number

$(24 - 25)r \rightarrow 32$

$4r \rightarrow 32$

$1r \rightarrow 8$

Original No. = $8 \times 25 = 200$

S14. Ans.(a)

Sol.

ATQ,

$(n - 2) \times 180 = 1800$

$n - 2 = 10$

$n = 12$

S15. Ans.(b)

Sol.

$7\sin^2\theta + 3\cos^2\theta = 4$

$7(1 - \cos^2\theta) + 3\cos^2\theta = 4$

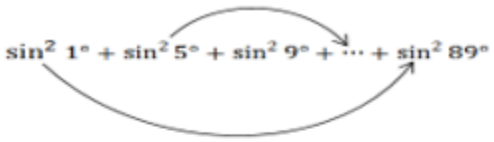
$\cos^2\theta = \frac{3}{4}$

$\cos\theta = \frac{\sqrt{3}}{2}$

$\theta = 30°$

$\tan\theta = \frac{1}{\sqrt{3}}$

S16. Ans.(a)
Sol.



$$\text{sum} = \frac{\text{number of terms}}{2} \qquad \begin{bmatrix} \sin^2 1 + \sin^2 89 \\ = \sin^2(90-89) + \sin^2 89 \\ = \cos^2 89 + \sin^2 89 \\ = 1 \end{bmatrix}$$

$= \frac{23}{2}$

$= 11\frac{1}{2}$

S17. Ans.(c)
Sol.
Total volume of two spherical balls = volume of cylinder of height 4 cm

$\frac{4}{3}\pi r_1^3 + \frac{4}{3}\pi r_2^3 = \pi \times a^2 \times 4$

$r_1 = 2r_2$[given]

$r_1^3 + r_2^3 = a^2 \times 3$

$8r_2^3 + r_2^3 = a^2 \times 3$

$r_2 = 3$ cm

$r_1 = 6$ cm

S18. Ans.(a)
Sol.
Triangle, 3a = 132
a = 44

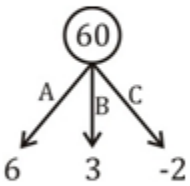
area $= \frac{\sqrt{3}}{4}a^2 = 484\sqrt{3}$

Square, 4a = 132
a = 33
area = $(33)^2 = 1089$
Circle, $2\pi r = 132$
r = 21
area = $\pi \times (21)^2$
= 1386
Area of circle will be the largest

S19. Ans.(b)
Sol.
l : b = 5 : 3
l = 5x
b = 3x

2 (l + b) × 7.50 = 6000
2 × 8x × 7.50 = 6000
x = 50
Difference between length & Breadth = 5x – 3x
= 2x
= 100 meter

S20. Ans.(b)
Sol.
A → 10 min.
B → 20 min.
C → –30 min.
Let the capacity of container
= L.C.M (10, 20, 30)
= 60



Time taken of fill the tank
$= \frac{60}{(6+3-2)}$
$= \frac{60}{7}\ min.$

S21. Ans. (c);
Sol.
$\text{Required Answer} = \frac{35\times30}{100} + \frac{35\times15}{100} + \frac{35\times15}{100}$
= 21 lakhs

S22. Ans. (d);
Sol.
$\text{Model A} = \frac{40-30}{30} \times 100 = 33\frac{1}{3}\%$
$\text{Model B} = \frac{20-15}{15} \times 100 = 33\frac{1}{3}\%$
$\text{Model C} = \frac{15-20}{20} \times 100 = -25\%$

S23. Ans. (a);
Sol.
$\text{Required difference} = \frac{44\times20}{100} - \frac{35\times15}{100}$
= 355000

S24. Ans. (b);
Sol.

$$\text{Required production} = \frac{44\times30}{100} \text{ lakhs}$$

$$= 1320000$$

S25. Ans. (c);
Sol.

$$\text{Required Ans.} = 35 \times \frac{10}{100} \times \frac{15}{100} + 44 \times \frac{10}{100} \times \frac{15}{100}$$

$$= 118500$$