**S1. Ans.(b)**
**Sol.** For the Frustum                     For the cylinder
$r_1 = 9$ cm                      r = 4 cm
$r_2 = 4$ cm                      h = 10 cm
h = 12 cm
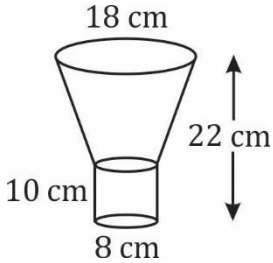


$l = \sqrt{h^2 + (r_1 - r_2)^2}$
$= \sqrt{12^2 + (9 - 4)^2}$
$= \sqrt{144 + 25}$
$= \sqrt{169} = 13$ cm
Area of the sheet required
= area of frustum + area of cylinder
$= \pi(r_1 + r_2)l + 2\pi\, rh$
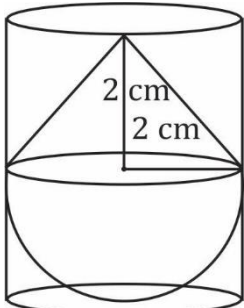$= \frac{22}{7}[(9 + 4) \times 13 + 2 \times 4 \times 10]$
$= \frac{22}{7}[169 + 80]$
$= \frac{22}{7} \times 249$
$= 782.57$ cm²

**S2. Ans.(a)**
**Sol.** Volume of the toy



$= \frac{1}{3}\pi r^2 h + \frac{2}{3}\pi r^3$
$= \frac{1}{3}\pi \times 2 \times 2 \times 2 + \frac{2}{3}\pi \times 2 \times 2 \times 2$

$= \frac{8\pi}{3} + \frac{16\pi}{3} = \frac{24\pi}{3} = 8\pi$ cm³

Volume of the cylinder $= \pi r^2 h$

$= \pi \times 2 \times 2 \times 4$

$= 16\pi$ cm³

Required difference $= 16\pi - 8\pi$

$= 8\pi$ cm³

$= 25.12$ cm³

### S3. Ans.(c)

**Sol.** Slum population of A in 1991

= 35% of 91.9 lakh

$= \frac{35}{100} \times 91.9$ lakh

= 32.165 lakh = 32 lakh

### S4. Ans.(c)

**Sol.** Difference = 21% of 25.5 lakh – 10% of 29.2 lakh

$= \frac{21}{100} \times 25.5$ lakh $- \frac{10}{100} \times 29.2$ lakh

= 5.355 – 2.920 = 2.435 lakh

### S5. Ans.(b)

**Sol.** Highest slum population is 32.165 lakh. It is present in A.

### S6. Ans.(d)

**Sol.** Let the present age of Mr. Suman

= 10x + y yrs.

Age of his wife = 10y + x yrs.

ATQ,

$\frac{1}{11}(10x + y + 10y + x) = (10x + y) - (10y + x)$

$\Rightarrow \frac{1}{11}(11x + 11y) = 9x - 9y$

$\Rightarrow x + y = 9x - 9y$

$\Rightarrow -8x = -10y$

$\Rightarrow \frac{x}{y} = \frac{10}{8} = \frac{5}{4}$

$\therefore$ x : y = 5 : 4

Age of Mr. Suman = (10 × 5 + 4) = 54 years

Age of wife of Mr. Suman = (10 × 4 + 5)

= 45 years

Required ratio = 54 : 45

= 6 : 5

### S7. Ans.(a)

**Sol.** Let the 4 numbers are A, B, C and D.

According to question:-

(A + 3) = (B – 3) = (C × 3) = (D ÷ 3)

Let (A + 3) = (B – 3) = (C × 3) = (D ÷ 3) = k (say)

Then, A = (k–3), B = (k+3); C $= \left(\frac{k}{3}\right)$, D = 3k

Also: - A + B + C + D = 64

$\Rightarrow (k - 3) + (k + 3) + \left(\frac{k}{3}\right) + (3k) = 64$

$\Rightarrow 5K + \frac{K}{3} = 64$

$\Rightarrow 16\,k = 64 \times 3$

$k = 12$

1st number = $(k - 3) = 9 = A$

2nd number = $(k + 3) = 15 = B$

3rd number = $\left(\frac{k}{3}\right) = 4 = C$

4th number = $3k = 36 = D$

So, required answer is = 36-4 =32

## S8. Ans.(d)
**Sol.** One part of the no. is the square of 6.

$\Rightarrow$ 36 must be present in the number and among the options given, none of the options fulfills this criteria.

So, None of these.

## S9. Ans.(c)
**Sol.** Let the numbers be A and B.

Then $\frac{1}{5}$ of A = $\frac{5}{8}$ of B

$\therefore \frac{A}{B} = \frac{5}{8} \times \frac{5}{1} = \frac{25}{8}$

Now : -

Let A = 25x, B = 8x

According to question :-

$(A + 35) \qquad = (B \times 4)$

Or, $(25x + 35) \qquad = 8x \times 4$

$\therefore x = 5$

$\therefore$ 2nd number = 8x = 8 × 5 = 40

## S10. Ans.(a)
**Sol.** Total age of the 4 members of the family,

10 yrs ago = 24 × 4 = 96 yrs.

Present age of 4 members = 96 + 40

= 136 yrs

Total age of the 7 members presently

= 22 × 7 = 154 yrs.

Age of [twins + youngest child]

= 154 – 136 = 18 yrs.

Let the age of the one of the twins = x yrs.

$\therefore$ age of the youngest = (x – 3) yrs

Then:-

2x + (x – 3) = 18

Or, 3x = 21

$\therefore$ x = 7

$\therefore$ Age of children = 7, 7, 4 yrs.

**S11. Ans.(d)**
**Sol.** Let each day's salary = Rs. x
Given, $18x + 8 \times \frac{x}{2} - 60 = 1700$
$\Rightarrow x = \frac{1760}{22}$
$\Rightarrow$ Monthly Salary $= \frac{1760}{22} \times 30 = 2400$

**S12. Ans.(b)**
**Sol.** Let $W_1$ & $W_2$ are two window of a house which are at the height of 6m & 2m above the ground
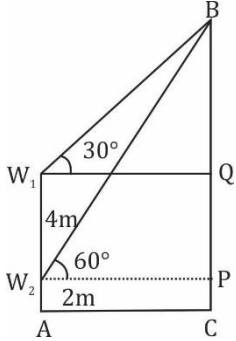


Let AC = x cm
$\Rightarrow W_1Q = W_2P = AC = xm$
$\Rightarrow QP = 4$ m
In $\Delta$ BPW$_2$
$\tan 60° = \frac{BP}{W_2P}$
$\sqrt{3} = \frac{BQ+4}{W_2P}$
$BQ + 4 = \sqrt{3} \times W_2P = \sqrt{3} \times x$ m
$\Rightarrow BQ = \sqrt{3}x - 4$ m
In $\Delta BQW_1$
$\tan 30° = \frac{BQ}{W_1Q}$
$\frac{1}{\sqrt{3}} = \frac{\sqrt{3}x - 4}{x}$
$\Rightarrow x = 3x - 4\sqrt{3}$
$\Rightarrow -2x = -4\sqrt{3}$
$\therefore x = 2\sqrt{3}$
Height of the balloon = BQ
$= \sqrt{3}x - 4$
$= \sqrt{3} \times 2\sqrt{3} - 4 = 6 - 4 = 2m$
Height of the balloon above the ground = 2 + 4 + 2 = 8 m

**S13. Ans.(c)**
**Sol.** $\because$ (||gm ABCD) & (||gm ABMN) are on the same base & between the same parallels.
$\therefore$ ar(||gm ABCD) = ar(||gm ABMN)
$\therefore$ ar(||gm ABCD) = 80 sq. unit
Again, $\Delta$ APN & ||gm (ABMN) are on the same base & between the same parallels.
$\therefore$ ar($\Delta$APN) $= \frac{1}{2}$ar(||gm ABMN)
$= \frac{1}{2} \times 80$ sq. unit $= 40$ sq unit.

## S14. Ans.(d)
**Sol.** $\angle CMB = x = \angle DCM$
(alternate interior angles)
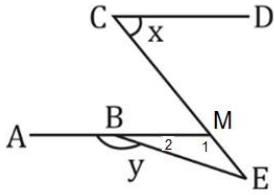


In $\Delta BME$
$\angle 1 = 180° - x$
$\angle 2 = 180° - y$
$\therefore \angle CEB = 180° - (\angle 1 + \angle 2)$
$\angle CEB = 180° - [180° - x + 180° - y]$
$= x + y - 180°$
$= x + y - \pi$

## S15. Ans.(b)
**Sol.** Suppose $(-4, 6)$ divides AB in the ratio of $K : 1$
$$\frac{A(-6,10)}{K} = \frac{B(-4,6)}{1} = \frac{B(3,-8)}{1}$$
By section formula
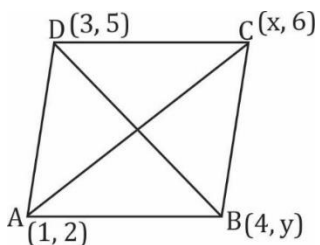$-4 = \frac{K \times 3 + 1 \times -6}{K+1}$
$-4K - 4 = 3K - 6$
$-7K = -2$
$K = \frac{2}{7}$
$\therefore$ Required ratio $= 2 : 7$

## S16. Ans.(b)
**Sol.** $\because$ diagonals of a ||gm bisect each other.



$\therefore$ Coordinates of mid point of AC
= Coordinates of mid point of BD.
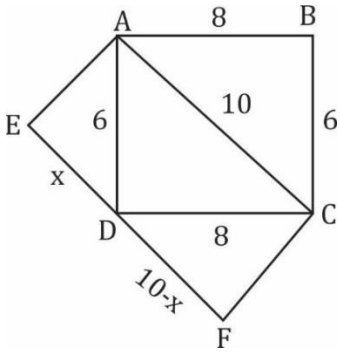$\left[\frac{1+x}{2}, \frac{2+6}{2}\right] = \left[\frac{3+4}{2}, \frac{5+y}{2}\right]$
$\Rightarrow \frac{1+x}{2} = \frac{7}{2}$ & $\frac{2+6}{2} = \frac{5+y}{2}$
$\Rightarrow x = 6$ $\qquad$ $y = 3$

**S17. Ans.(c)**
**Sol.** Let ED = x
Now, AC = $\sqrt{8^2 + 6^2} = 10$



In Δ AED,
$AE^2 = AD^2 - x^2 = 36 - x^2$ _____(i)
And in Δ CFD,
$CF^2 = (8)^2 - (10 - x)^2$ _____(ii)
From Eqs. (i) and (ii), we get
$36 - x^2 = 64 - (10 - x)^2$ (∵ AE = FC)
$\Rightarrow 36 - x^2 = 64 - (100 + x^2 - 20x)$
$\Rightarrow 20x = 72$
$\Rightarrow x = \frac{18}{5}$
∵ From Eq. (i) $AE^2 = 36 - \left(\frac{18}{5}\right)^2$
$AE^2 = 36 - \frac{324}{25} = \frac{900 - 324}{25}$
∵ $\frac{\text{Area of rectangle ABCD}}{\text{Area of recetangle AEFC}} = \frac{8 \times 6}{10 \times \frac{24}{5}} = 1$

**S18. Ans.(d)**
**Sol.** Side of the square filed = $\sqrt{31684}$
= 178 m
Perimeter of the square field = 4 × 178
= 712 m
Length of the wire required to cover the field once = 105% of 712 m
= 1.05 × 712
= 747.6 m
Total length of the wire = 4 × 747.6
= 2990.4 m

**S19. Ans.(d)**

**Sol.**

Let r be the radius of the circular ground.
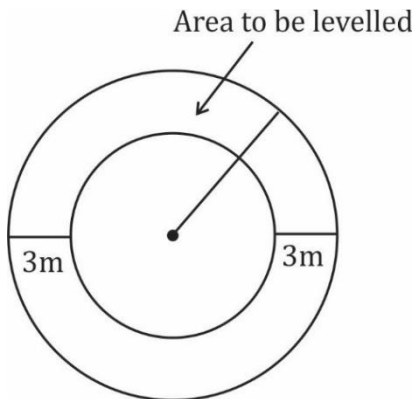


∴ $2\pi r = 88 \Rightarrow r = 14$
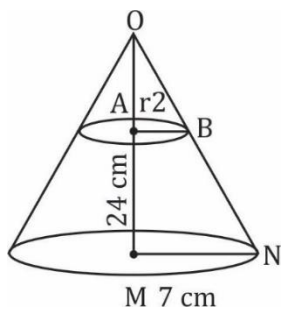
∴ Area of the ground to be levelled $= \pi \times 14^2 - \pi \times 11^2 = 196\pi - 121\pi = 75\pi$

Cost of leveling $= 75 \times \frac{22}{7} \times 7 = Rs.\,1650$.

**S20. Ans.(b)**

**Sol.** Height of the upper part of the cone $= \frac{1}{2} \times 24 = 12$ cm

OA = 12 cm



∵ ΔAOB~Δ MON
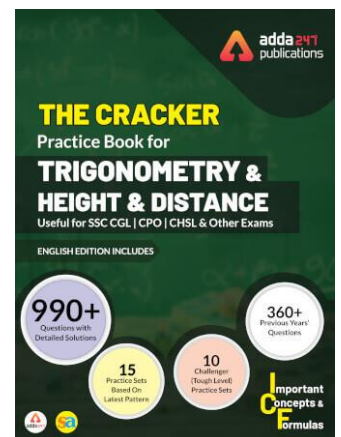
$\Rightarrow \frac{OA}{OM} = \frac{AB}{MN}$

$\Rightarrow \frac{12}{24} = \frac{AB}{7}$

∴ $AB = \frac{7}{2}$ cm

Volume of the upper part $= \frac{1}{3}\pi r^2 h$

$= \frac{1}{3} \times \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} \times 12 = 154 \text{ cm}^2$

**S21. Ans.(a)**
**Sol.** Ratio of CP = 1 : 2 : 4
Ratio of No.
of articles
Sold   = 2   :      5     :      2
         2    :      10    :      8
Ratio of % profit = 10% : 20% : 25%
SP = 1 × 1.1 :   5 × 1.2 :   4 × 1.25
Total SP      = 1.1   : 6      : 5   = 12.1
So, Net % profit = $\frac{12.1-10}{10} \times 100$ = 21%

**S22. Ans.(c)**
**Sol.** Given that:-
Invested ratio of A : B : C = 5 : 7 : 6
After 6 months:-
Invested ratio of A : B : C = 60 : 84 : 54
Now, ratio = 40000*12 : 56000*12 : (48000*6+24000*6)
Profit ratio = 10: 14 : 9

Share of profit of C = $\frac{9}{33} \times 33000$
= Rs. 9000

**S23. Ans.(c)**
**Sol.** According to question:-

Sohan = 25000 × (36 months)
= Rs. 900000
Aditya = [15000 × 30 + 15000 × 24]
= Rs. 810000
∴ Profit share of Aditya
= $\frac{\text{Sohan}}{\text{Sohan+Mohan}} \times 247000$
= $\frac{9}{19} \times 247000$
= 1,17,000

**S24. Ans.(a)**
**Sol.** 25 men and 15 women complete a piece of work in 12 days.
∴ work of 8 days = $\frac{1}{12} \times 8 = \frac{2}{3}$
Remaining work = $1 - \frac{2}{3} = \frac{1}{3}$
Now:-
$\frac{1}{3}$ piece of work completed by 25 men in 6 days.

∴ 1 work can be completed by 25 men in 18 days.

Now:-

∴ Total work done by women

$= \frac{1}{12} - \frac{1}{18} = \frac{3-12}{36}$

$= \frac{1}{36} = 36$ days

## S25. Ans.(b)

**Sol.** 12 men takes 18 days to compete 1 work.

∴ 12 men will take 1 day to complete $\frac{1}{18}$ work

∴ 1 man will take 1 day to complete $\frac{1}{18 \times 12}$ work

∴ 10 men will complete the job in

$= \frac{10}{18 \times 12} + \frac{8}{12 \times 24}$

$= \frac{5}{108} + \frac{4}{144}$

$= \frac{20+12}{432} = \frac{32}{432}$

∴ 10 men will take $\frac{432}{32} = \frac{27}{2} = 13\frac{1}{2}$ days to complete a job.

## S26. Ans.(c)

**Sol.** Let no. of candidates of type A = 100

According to question : -

$\frac{80}{100}$ of $\frac{40}{100}$ of $100 = 32$

Now:-

% remaining no. of candidates = (100 – 32)%

= 68%

## S27. Ans.(c)

**Sol.**

| Man : | Day : | Time | = | work |
|---|---|---|---|---|
| 117 | 33 | 8 | = | $\frac{4}{7}$ |
| x | 13 | 9 | = | $\frac{3}{7}$ |

∴ x $= \frac{117 \times 33 \times 8 \times 3}{13 \times 9 \times 4} = \frac{92664}{468} = 198$

∴ Required no. = 198 – 117 = 81

## S28. Ans.(c)
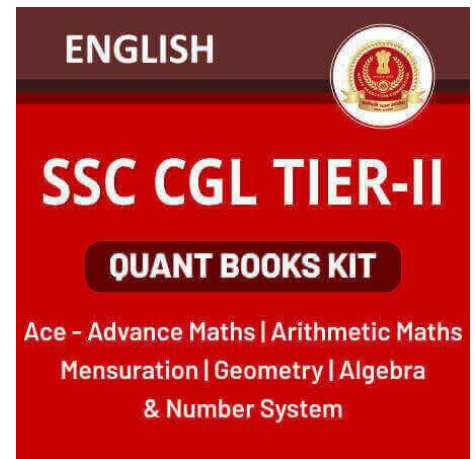
**Sol.** Ratio of the amount of water filled in the

| Cistern = $1^2$ | : | $\frac{16}{9}$ | : | 4 |
|---|---|---|---|---|
| = 9 | : | 16 | : | 36 |

∵ 36 cubic unit of water is filled by the pipe of largest diameter in 61 minute

water is filled by all the pipe in $= \frac{61 \times 36}{61}$

= 36 minutes

**S29. Ans.(c)**
**Sol.** Time taken by pipe B (to empty) is less than the time taken by pipe A (to fill)
⇒ Rate of empty > Rate of filling
Now, Time required to empty the $\frac{2}{5}$ th of the tank already filled when both the pipe A and B are opened together.

$= \frac{2}{5} \times \left( \frac{10 \times 6}{10 - 6} \text{minutes} \right)$

= 6 minutes

**S30. Ans.(d)**
**Sol.** Logical solution: -
Let the initial no. of total passengers = 4x
⇒ Initial ratio of male to female passengers = 3 : 1 (Given)
At the first stop ,
No. of males = 3x − m
No. of females = (x - f )+6
ATQ,

$\frac{3x - m}{(x - f) + 6} = \frac{2}{1}$

x = 28 – 3f
So, from options f= 4 and X = 16.
So, 4x= 16*4 = 64
⇒ correct option will be option (D).