

Quant Mega Quiz for SSC Tier-1 (Solutions)

S1. Ans.(b)

Sol.

$$M_1 D_1 = M_2 D_2$$

$$\Rightarrow 9 \times 20 = M_2 \times 15$$

$$\Rightarrow M_2 = \frac{9 \times 20}{15} = 12 \text{ pipes}$$

Note : Same relation as men and days is applicable

S2. Ans.(d)

Sol.

$$(\text{Raj} + \text{Ram})\text{'s 1 day's work} = \frac{1}{10}$$

$$\text{Raj's 1 day's work} = \frac{1}{12}$$

$$\therefore \text{Ram's 1 day's work}$$

$$= \frac{1}{10} - \frac{1}{12} = \frac{6-5}{60} = \frac{1}{60}$$

$$\therefore \text{Required time} = 60 \text{ days}$$

S3. Ans.(c)

Sol.

Marked price = Rs. x and cost price = Rs. y.

$$\therefore 50\% \text{ of } x = 90\% \text{ of } y$$

$$\Rightarrow \frac{x \times 50}{100} = \frac{y \times 90}{100}$$

$$\Rightarrow y = \frac{x \times 50}{90} = \text{Rs. } \frac{5}{9}x = \frac{5}{9} \text{ th of marked price.}$$

S4. Ans.(b)

Sol.

$$= \text{Rs. } (7710 + 1285)$$

$$= \text{Rs. } 8995$$

If discount = x %, then x % of 8995 = 1285

$$\Rightarrow \frac{8995 \times x}{100} = 1285$$

$$\Rightarrow x = \frac{1285 \times 100}{8995} = \frac{100}{7} = 14 \frac{2}{7} \%$$

S5. Ans.(a)

Sol.

C.P. of cycle = Rs. x

$$\therefore 840 \times \frac{90}{100} = \frac{x \times 126}{100}$$

$$\Rightarrow x \times 126 = 840 \times 90$$

$$\Rightarrow x = \frac{840 \times 90}{126} = \text{Rs. } 600$$



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S6. Ans.(d)

Sol.

Marked price of article = Rs. x

$$\therefore \text{C.P. of article} = \text{Rs. } \frac{2x}{5}$$

$$\text{S.P. of article} = \frac{x \times 90}{100}$$

$$= \text{Rs. } \frac{9x}{10}$$

$$\text{Gain} = \frac{9x}{10} - \frac{2x}{5} = \frac{9x-4x}{10}$$

$$= \frac{5x}{10} = \frac{x}{2}$$

$$\therefore \text{Gain per cent} = \frac{\text{Gain} \times 100}{\text{C.P.}}$$

$$= \frac{\frac{x}{2} \times 100}{\frac{2x}{5}} = \frac{5 \times 100}{4}$$

$$= 125\%$$

S7. Ans.(a)

Sol.

Amount lent at 8% rate of interest = Rs. x

\therefore Amount lent at $\frac{4}{3}\%$ rate of interest = Rs. (20,000 - x)

$$\therefore \text{S.I.} = \frac{\text{Principal} \times \text{Rate} \times \text{Time}}{100}$$

$$\therefore \frac{x \times 8 \times 1}{100} + \frac{(20,000 - x) \times \frac{4}{3} \times 1}{100}$$

$$= 800$$

$$\Rightarrow \frac{2x}{25} + \frac{20,000 - x}{75} = 800$$

$$\Rightarrow x = \frac{40,000}{5} = \text{Rs. } 8000$$

S8. Ans.(b)

Sol.

In 20 litres of mixture,

Alcohol $\Rightarrow (20 \times 20)100 = 4$ litres

Water $\Rightarrow 20 - 4 = 16$ litres

On adding 4 litres of water,

Quantity of water $\Rightarrow 16 + 4 = 20$ litres

Quantity of mixture = 24 litres

\therefore Required per cent

$$= \frac{4}{24} \times 100 = \frac{50}{3} = 16\frac{2}{3}\%$$

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S9. Ans.(a)

Sol.

Son : wife = 3 : 1 = 9 : 3

Wife : daughter = 3 : 1

∴ Son : wife : daughter

= 9 : 3 : 1

Sum of ratio = 9 + 3 + 1 = 13

If total wealth be Rs. x, then

Son's share - daughter's share

= Rs. 10,000

$$\Rightarrow \frac{9x}{13} - \frac{x}{13} = 10,000$$

$$\Rightarrow x = \frac{13,00,00}{8} = \text{Rs. } 16250$$

S10. Ans.(d)

Sol.

Capacity of each container = x litre (let)

In first container,

Milk = $\frac{3x}{4}$ litres,

Water = $\frac{x}{4}$ litres

In second container,

Milk = $\frac{5x}{7}$ litres,

Water = $\frac{2x}{7}$ litres

On mixing both,

$$\text{Quantity of milk} = \frac{3x}{4} + \frac{5x}{7}$$

$$= \frac{21x+20x}{28} = \frac{41x}{28} \text{ litres}$$

$$\text{Quantity of water} = \frac{x}{4} + \frac{2x}{7}$$

$$= \frac{7x+8x}{28} \text{ litres} = \frac{15x}{28} \text{ litres}$$

∴ Required ratio

$$= \frac{41x}{28} : \frac{15x}{28} = 41 : 15$$

S11. Ans.(c)

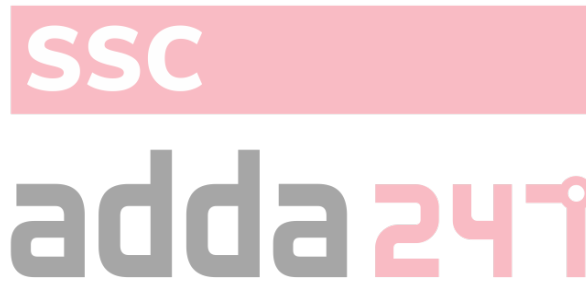
Sol.

Let the principal be Rs. P

$$\therefore \text{C.I.} = P \left[\left(1 + \frac{R}{100} \right)^2 - 1 \right]$$

$$\Rightarrow 328 = P \left[\left(1 + \frac{5}{100} \right)^2 - 1 \right]$$

$$\Rightarrow P = \frac{328 \times 400}{41} = \text{Rs. } 3200$$



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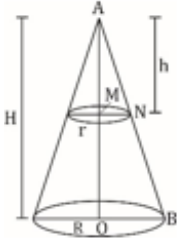
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S12. Ans.(b)

Sol. Let H and R be the height and radius of bigger cone respectively and h and r that of smaller cone.

From triangles AOB and AMN.

∠A is common and MN ∥ OB.



∴ Triangles AOB and AMN are similar,

$$\therefore \frac{AO}{AM} = \frac{BO}{MN}$$

$$\Rightarrow \frac{30}{h} = \frac{R}{r} \dots\dots\dots (i)$$

$$\text{Volume of smaller cone} = \frac{1}{3} \pi r^2 h$$

$$\text{Volume of bigger cone} = \frac{1}{3} \pi R^2 H$$

∴ According to the question,

$$\frac{1}{3} \pi r^2 h = \left(\frac{1}{3} \pi R^2 H \right) \times \frac{1}{27}$$

$$\Rightarrow \frac{27h}{H} = \left(\frac{30}{h} \right)^2 \dots\dots\dots [\text{From (i)}]$$

$$\Rightarrow \frac{27h}{H} = \frac{900}{h^2}$$

$$\Rightarrow 27h^3 = 900H = 900 \times 30$$

$$\Rightarrow h^3 = \frac{900 \times 30}{27} = 1000$$

$$\Rightarrow h = \sqrt[3]{1000} = 10 \text{ cm}$$

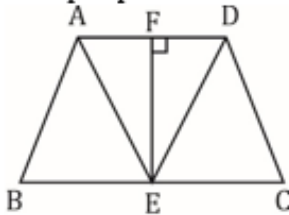
$$\therefore \text{Required height} = 30 - 10 = 20 \text{ cm}$$



S13. Ans.(d)

Sol.

EF is perpendicular on side AD.



∴ Area of trapezium

$$= \frac{1}{2} (AD + BC) \times EF$$

$$\text{Area of } \Delta AED = \frac{1}{2} \times AD \times EF$$

∴ Required ratio

$$= \frac{\frac{1}{2} (AD + BC) \times EF}{\frac{1}{2} \times AD \times EF}$$

$$= \frac{AD + BC}{AD}$$

$$= \frac{AD + BC}{AD}$$

S14. Ans.(c)

Sol.

$$\text{Surface area of sphere} = 4\pi r^2$$

$$\therefore 4 \times \frac{22}{7} \times r^2 = 346.5$$

$$\therefore r^2 = \frac{346.5 \times 7}{4 \times 22} = 27.5$$

$$\therefore r = \sqrt{27.5625} = 5.25 \text{ cm}$$

S15. Ans.(c)

Sol. If the number of sides of regular polygon be n, then Each interior angle

$$= \frac{(2n-4) \times 90^\circ}{n}$$

$$\text{And each exterior angle} = \frac{360^\circ}{n}$$

$$\therefore \frac{(2n-4)}{n} \times 90^\circ = \frac{(5 \times 360^\circ)}{n}$$

$$\Rightarrow n = \frac{24}{2} = 12.$$

S16. Ans.(a)

Sol.

Volume of pyramid

$$= \frac{1}{3} \times \text{area of base} \times \text{height}$$

$$\Rightarrow 500 = \frac{1}{3} \times 30 \times h$$

$$\Rightarrow h = \frac{500}{10} = 50 \text{ metre}$$

S17. Ans.(c)

Sol.

Hypotenuse of base

$$= \sqrt{5^2 + 12^2}$$

$$= 13 \text{ cm}$$

\therefore Surface area

$$= h(a+b+c)$$

$$= 10(5+12+13) = 300 \text{ sq.cm.}$$

$$\text{Area of base} = \frac{1}{2} \times 5 \times 12$$

$$= 30 \text{ sq.cm.}$$

\therefore Total surface area of lateral surfaces

$$= 300 + 30$$

$$= 330 \text{ sq. cm.}$$



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S18. Ans.(a)**Sol.**

$$\begin{aligned} \text{In-radius} &= \frac{a}{2\sqrt{3}} \\ &= \frac{24}{2\sqrt{3}} = 4\sqrt{3} \text{ cm} \end{aligned}$$

$$\begin{aligned} \text{Area of triangle} &= \frac{\sqrt{3}}{4} \times (\text{side})^2 \\ &= \frac{\sqrt{3}}{4} \times 24 \times 24 \\ &= 249.408 \text{ sq.cm.} \end{aligned}$$

$$\begin{aligned} \text{Area of circle} &= \pi r^2 \\ &= \frac{22}{7} \times 4\sqrt{3} \times 4\sqrt{3} \\ &= \frac{1056}{7} = 150.86 \text{ sq.cm.} \end{aligned}$$

$$\begin{aligned} \text{Area of remaining part} &= (249.408 - 150.86) \text{ sq. cm.} \\ &\approx 98.55 \text{ sq.cm.} \end{aligned}$$

S19. Ans.(a)**Sol.**

Lateral surface area of prism = 3 × side × height

$$\therefore 3 \times \text{side} \times \text{height} = 120$$

$$\begin{aligned} \Rightarrow \text{Side} \times \text{height} &= \frac{120}{3} \\ &= 40 \text{ sq.cm.} \dots\dots\dots (i) \end{aligned}$$

Volume of prism = Area of base × height

$$\Rightarrow 40\sqrt{3} = \frac{\sqrt{3}}{4} \times \text{side}^2 \times \text{height}$$

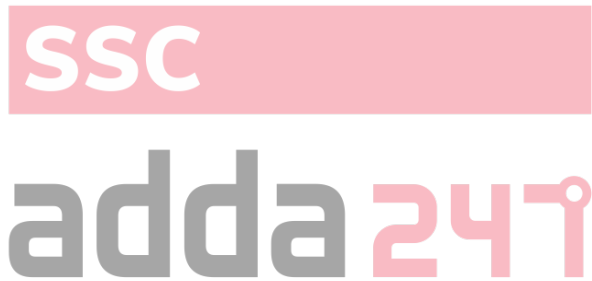
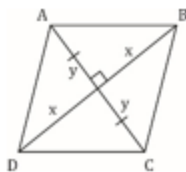
$$\Rightarrow \frac{40\sqrt{3} \times 4}{\sqrt{3}} = \text{side}^2 \times \text{height}$$

$$\Rightarrow \text{side}^2 \times \text{height}$$

$$= 160 \text{ cu.cm} \dots\dots\dots (ii)$$

Dividing equation (ii) by (i),

$$\text{Side} = \frac{160}{40} = 4 \text{ cm.}$$

**S20. Ans.(c)****Sol.**

Side of a rhombus

$$= \frac{2p}{4} = \frac{p}{2} \text{ units}$$

$$OA = OC = y \text{ (let)}$$

$$\therefore AC = 2y \text{ units}$$

$$OB = OD = x \text{ (let)}$$

$$\therefore BD = 2x \text{ units}$$

From ΔOAB ,

$$\angle AOB = 90^\circ$$

$$\begin{aligned}
 AB^2 &= OA^2 + OB^2 \\
 \Rightarrow \frac{p^2}{4} &= x^2 + y^2 \\
 \Rightarrow p^2 &= 4x^2 + 4y^2 \dots\dots\dots (i) \\
 \text{And } 2x + 2y &= m \\
 \text{On squaring both sides,} \\
 4x^2 + 4y^2 + 8xy &= m^2 \\
 \Rightarrow p^2 + 8xy &= m^2 \\
 \Rightarrow 8xy &= m^2 - p^2 \\
 \Rightarrow 4xy &= \frac{1}{2}(m^2 - p^2) \\
 \therefore \text{Area of the rhombus} \\
 &= \frac{1}{2} \times 2x \times 2y = \frac{1}{2} \times 4xy \\
 &= \frac{1}{2} \times \frac{1}{2}(m^2 - p^2) \\
 &= \frac{1}{4}(m^2 - p^2) \text{ sq. units}
 \end{aligned}$$

S21. Ans.(a)

Sol. Speed of train = 54 kmph
 $= \left(\frac{54 \times 5}{18}\right) \text{ m/sec} = 15 \text{ m/sec}$

Required time

$$\begin{aligned}
 &= \frac{\text{Length of trains}}{\text{Speed of train}} \\
 &= \frac{300}{15} = 20 \text{ seconds}
 \end{aligned}$$

S22. Ans.(b)

Sol. Time taken in covering 5

$$\begin{aligned}
 \text{Km} &= \frac{5}{10} = \frac{1}{2} \text{ hour} \\
 &= 30 \text{ minutes}
 \end{aligned}$$

That person will take rest for four times.

$$\begin{aligned}
 \therefore \text{Required time} \\
 &= (30 + 4 \times 5) \text{ minutes} \\
 &= 50 \text{ minutes}
 \end{aligned}$$

S23. Ans.(d)

Sol. Amount borrowed = Rs. x

$$\begin{aligned}
 \therefore \text{Interest to be paid} &= \frac{x \times 3}{100} \\
 &= \text{Rs. } \frac{3x}{100}
 \end{aligned}$$

Case II,

$$\text{Rate} = \frac{5}{2} \% \text{ per half year}$$

Time = 2 half years

$$\begin{aligned}
 \therefore \text{C. I.} &= P \left[\left(1 + \frac{R}{100}\right)^T - 1 \right] \\
 &= x \left[\left(1 + \frac{5}{200}\right)^2 - 1 \right]
 \end{aligned}$$



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$$\begin{aligned}
&= x \left[\left(1 + \frac{5}{200} \right)^2 - 1 \right] \\
&= \text{Rs. } \frac{81x}{1600} \\
\text{Difference} &= \frac{81x}{1600} - \frac{3x}{100} \\
&= \frac{81x - 48x}{1600} \\
&= \text{Rs. } \frac{33x}{1600} \\
\therefore \frac{33x}{1600} &= 330 \\
\Rightarrow x &= \frac{1600 \times 330}{33} = \text{Rs. } 16000
\end{aligned}$$

S24. Ans.(b)

Sol. Present worth of bike

$$\begin{aligned}
&= P \left(1 - \frac{R}{100} \right)^T \\
&= 62500 \left(1 - \frac{4}{100} \right)^2 \\
&= \text{Rs. } 57600
\end{aligned}$$

S25. Ans.(d)

Sol. Principal = Rs. P (let)

$$\begin{aligned}
\therefore \text{C.I.} &= P \left[\left(1 + \frac{R}{100} \right)^T - 1 \right] \\
\Rightarrow 510 &= P \left[\left(1 + \frac{25}{200} \right)^2 - 1 \right] \\
\Rightarrow 510 &= \frac{17P}{64} \\
\Rightarrow P &= \frac{510 \times 64}{17} = \text{Rs. } 1920
\end{aligned}$$

\therefore S.I.

$$\begin{aligned}
&= \frac{\text{Principal} \times \text{Time} \times \text{Rate}}{100} \\
&= \frac{1920 \times 2 \times 25}{100 \times 2} = \text{Rs. } 480
\end{aligned}$$

S26. Ans.(c)

Sol. Number of wrist watches sold in 2010 = 28.7 lakhs

Number of table clocks sold in 2010 = 22.3 lakhs

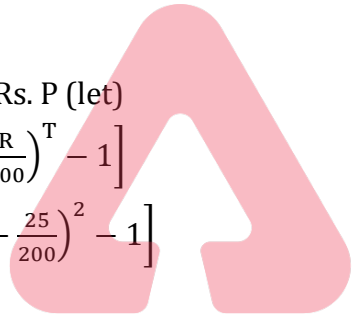
\therefore Required per cent

$$\begin{aligned}
&= \left(\frac{28.7 - 22.3}{22.3} \right) \times 100 \\
&= \frac{6.4}{22.3} \times 100 \approx 28.7\%
\end{aligned}$$

S27. Ans.(d)

Sol. Required ratio = 3.5 : 9.5

= 7 : 19



S28. Ans.(b)**Sol.** Required per cent

$$= \frac{30.7-9.5}{30.7} \times 100$$
$$= \frac{21.2 \times 100}{30.7} = 69.05\%$$

S29. Ans.(d)**Sol.** Here, decrease is evident from bar diagram.Wrist watches : 21.3 \Rightarrow 28.7 lakhsTable clocks 9.5 \Rightarrow 22.3 lakhsWall clocks 30.7 \Rightarrow 32.7 lakhs**S30. Ans.(a)****Sol.** Percentage increase in the sales of table clocks

$$= \frac{(22.3-9.5)}{9.5} \times 100$$
$$= \frac{12.8}{9.5} \times 100 \approx 135$$

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