

## Quant Mega Quiz for SSC Tier-1 (Solutions)

### S1. Ans.(d)

**Sol.**

Amit : Veer

Income → 3 : 2

Amit →  $3x$

Veer →  $2x$

Amit : Veer

Expenditure → 5 : 3

Amit →  $5y$

Veer →  $3y$

$$3x - 5y = 1000$$

$$2x - 3y = 1000$$

$$6x - 10y = 2000$$

$$6x - 9y = 3000$$

$$y = 1000$$

$$x = 2000$$

$$\text{Salary of Amit} = 3 \times 2000$$

$$= 6000 \text{ Rs.}$$

### S2. Ans.(a)

**Sol.**

$$A : B = 3 : 2$$

$$B : C = 3 : 2$$

$$A : B : C = 9 : 6 : 4$$

Incomes →

$$A \rightarrow 9x$$

$$B \rightarrow 6x$$

$$C \rightarrow 4x$$

$$\frac{1}{3} \times 9x - \frac{1}{4} \times 4x = 1000$$

$$3x - x = 1000$$

$$2x = 1000$$

$$x = 500$$

$$B's \text{ Income} = 6 \times 500$$

$$= 3000 \text{ Rs.}$$

### S3. Ans.(c)

**Sol.**

Refrigerator : Television

5 : 3

$$2r \rightarrow 5500$$

$$1r \rightarrow 2750$$

Price of Refrigerator

$$5 \times 2750 = 13750 \text{ Rs.}$$

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**S4. Ans.(a)**

**Sol.**

Successful : Unsuccessful

6 : 1

Successful  $\rightarrow 6x$

Unsuccessful  $\rightarrow x$

$$\frac{6x + 6}{x - 6} = \frac{9}{1}$$

$$6x + 6 = 9x - 54$$

$$3x = 60$$

$$x = 20$$

$$\text{Total} = 7x$$

$$= 7 \times 20$$

$$= 140$$

**S5. Ans.(d)**

**Sol.**

Box : Paper

3 : 22

$$25r \rightarrow 36$$

$$22r \rightarrow \frac{36 \times 1000 \times 22}{25}$$

$$= 31680 \text{ gm}$$

**S6. Ans.(c)**

**Sol.**

B : G = 5 : 4

$$9 \rightarrow 432$$

$$1 \rightarrow 48$$

$$\text{Boys} = 240$$

$$\text{Girls} = 192$$

$$\text{Now, Total boys} = 240 + 12$$

$$= 252$$

Let to no. of girls added is x

$$\frac{252}{192 + x} = \frac{7}{6}$$

$$x = 24$$

**S7. Ans.(b)**

**Sol.**

$$\frac{2A}{3} = \frac{4B}{5}$$

$$A : B = 6 : 5$$

**S8. Ans.(d)**

**Sol.**

Let they divided the sum in x, y, z

$$x - 22 = 7a \Rightarrow x = 7a + 22$$

$$y - 35 = 10a \Rightarrow y = 10a + 35$$

$$z - 48 = 13a \Rightarrow z = 13a + 48$$

$$7a + 22 + 10a + 35 + 13a + 48$$

$$= 15525$$

$$a = 514$$

Hence,

$$x = 3620$$

$$y = 5175$$

$$z = 6730$$

Ratio after adding, 16,77 & 37

$$3636 : 5252 : 6767$$

**S9. Ans.(a)**

**Sol.**

Ratio  $\rightarrow$

$$\frac{1}{3} : \frac{1}{4} : \frac{1}{5} : \frac{1}{6}$$

$$\Rightarrow \frac{60}{3} : \frac{60}{4} : \frac{60}{5} : \frac{60}{6}$$

$$\Rightarrow 20 : 15 : 12 : 10$$

Minimum no. of Rens

He should have

$$= 20 + 15 + 12 + 10$$

$$= 57$$

**S10. Ans.(b)**

**Sol.**

Boys : Girls

$$5 : 3$$

$$\frac{5x - 50}{3x + 50} = \frac{9}{7}$$

$$35x - 350 = 27x + 450$$

$$8x = 800$$

$$x = 100$$

Number of Boys

$$= 5x - 50$$

$$= 500 - 50$$

$$= 450$$



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**S11. Ans.(c)****Sol.**Let C.P of 1 camera  $\rightarrow$  100

C.P of 20 cameras = 2000

S.P of 20 cameras

$$= 1200 \times \frac{120}{100} + 800 \times \frac{110}{100}$$

$$= 1440 + 880$$

$$= 2320$$

$$\text{Profit} = 2320 - 2000 = 320$$

S.P of 20 cameras at profit 15%

$$= 2000 \times \frac{115}{100}$$

$$= 2300$$

$$\text{Profit} = 2300 - 2000$$

$$= 300$$

$$\text{Reduction in Profit} = 320 - 300 = 20$$

$$20r \rightarrow 36$$

$$1r \rightarrow 1.8$$

$$100r \rightarrow 1.8 \times 100$$

$$= 180$$

$$\text{C.P of 1 camera} = 180$$

**S12. Ans.(c)****Sol.**

Original M.P = 400 Rs.

M.P is 33.33% greater than C.P

$$33.33\% = \frac{1}{3} \rightarrow \text{Increase}$$

$$\rightarrow \text{C.P}$$

$$\text{M.P} \Rightarrow (3 + 1)r \Rightarrow 400 \text{ Rs.}$$

$$4r \Rightarrow 400$$

$$1r \Rightarrow 100$$

$$3r \Rightarrow 300$$

$$\text{C.P} = 300 \text{ Rs.}$$

Let S.P be x

$$\text{Profit} = x - 300$$

$$\text{Increased M.P} = 400 \times \frac{125}{100} = 500 \text{ Rs.}$$

$$16.66\% \Rightarrow \frac{1}{6} \rightarrow \text{Increase}$$

$$\rightarrow \text{S.P}$$

$$6r \rightarrow x$$

$$(6 + 1)r \rightarrow \frac{x}{6} \times 7$$

$$\text{Increased S.P} = \frac{7}{6}x$$

$$\text{Profit} = \frac{7}{6}x - 300$$

ATQ,

$$\frac{7}{6}x - 300 = 2(x - 300)$$

$$\frac{7}{6}x - 2x = -600 + 300$$

$$x = 360$$

$$\text{Increased S.P} = \frac{7}{6} \times 360 = 420 \text{ Rs.}$$

**S13. Ans.(c)****Sol.**

C.P of A = Rs. 160

Let S.P of A = x

S.P of B = Rs. 240

Let C.P of B = y

If S.P of A = C.P of B, Then profit is 20% on selling A

$$\therefore 160 \times \frac{120}{100} = y$$

$$y = 192$$

$$\text{Profit of B} = 240 - 192$$

$$= 48$$

$$\text{Profit \%} = \frac{48}{192} \times 100$$

$$= 25\%$$

**S14. Ans.(c)****Sol.**

Let S.P of cold drinks of both companies be x

$$\text{M.P of Pepsi} = x \times \frac{100}{90} \times \frac{100}{75}$$

$$\text{M.P of Coke} = x \times \frac{100}{85} \times \frac{100}{80}$$

Ratio  $\Rightarrow$ 

$$x \times \frac{100}{90} \times \frac{100}{75} : x \times \frac{100}{85} \times \frac{100}{80}$$

$$85 \times 80 : 90 \times 75$$

$$136 : 135$$

**S15. Ans.(b)****Sol.**

Let C.P = 100

Tag price = 80

S.P after discount

$$= 80 \times \frac{93.75}{100}$$

$$= 75 \text{ Rs.}$$

$$\text{Loss} = 100 - 75 = 25 \text{ Rs.}$$

25 Rs. are less at C.P of Rs. 100

$$1 \text{ Rs. less at C.P of} = \frac{100}{25}$$

$$37.5 \text{ Rs. less at C.P of} = \frac{100}{25} \times 37.5 = \text{Rs. } 150$$

$$\text{S.P} = 150 - 37.5 = \text{Rs. } 112.5$$

**S16. Ans.(c)****Sol.**

C.P                      S.P

100                      95

100                      103.33

Profit 3.33%

$$(103.33 - 95)r \rightarrow 65$$

$$8.33r \rightarrow 65$$

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$$1r \rightarrow \frac{65}{8.33} \cong 7.80$$

$$100r \rightarrow 780$$

$$CP = \text{Rs. } 780$$

$$S.P = 936$$

$$\text{Profit \%} = \frac{156}{780} \times 100$$

$$= 20\%$$

### S17. Ans.(a)

**Sol.**

$$\text{Let C.P of watch} = x$$

$$\text{Profit \%} = x\%$$

$$x \times \frac{(100 + x)}{100} = 96$$

$$x^2 + 100x = 9600$$

$$x^2 + 100x - 9600 = 0$$

$$x^2 + 160x - 60x - 9600 = 0$$

$$x(x + 160) - 60(x + 160) = 0$$

$$x = 60$$

$$\text{New S.P} = 60 \times \frac{220}{100}$$

$$= 132$$

### S18. Ans.(b)

**Sol.**

$$\text{Let C.P of 1000 gm} \rightarrow \text{Rs. } 1000$$

$$\text{C.P of 1100 gm} \rightarrow \text{Rs. } 1000$$

$$\text{C.P of 1000 gm for shopkeeper} \rightarrow \frac{10000}{11}$$

$$\text{S.P of 900 gm} \rightarrow \text{Rs. } 1000$$

$$\text{S.P of 1000 gm} \rightarrow \frac{10000}{9}$$

$$\text{Profit} = \frac{10000}{9} - \frac{10000}{11}$$

$$= \frac{20000}{99}$$

$$\text{Profit \%} = \frac{\frac{20000}{99}}{\frac{10000}{11}} \times 100$$

$$= \frac{200}{9} = 22\frac{2}{9}\%$$

### S19. Ans.(b)

**Sol.**

$$\text{Profit \%} = 14\frac{2}{7}\%$$

$$= \frac{1}{7} \rightarrow \text{Profit}$$

$$= \frac{1}{7} \rightarrow \text{S.P}$$

$$C.P = 7 - 1 = 6$$

$$7r \rightarrow 280$$

$$1r \rightarrow 40$$

$$6r \rightarrow 240$$

$$C.P \Rightarrow 240$$

$$S.P \Rightarrow 280$$

$$\text{Actual Profit} = \frac{40}{240} \times 100$$

$$= \frac{50}{3} = 16.66\%$$

S20. Ans.(a)

Sol.

$$P\% = M\% - D\% - \frac{MD}{100}$$

$$32 = M - 12 - \frac{12M}{100}$$

$$44 = \frac{22}{25}M$$

$$M = 50\%$$

$$P = 50 - 20 - \frac{20 \times 50}{100}$$

$$= 50 - 20 - 10$$

$$= 20\%$$

S21. Ans.(a)

Sol.

$$\text{Length of train} = 12 \times 15 = 180 \text{ m}$$

$$\text{Time} = 18 \text{ sec.}$$

$$\text{Speed} = \frac{180}{18} = 10 \text{ m/sec}$$

$$\text{New Distance} = 15 \times 10 = 150 \text{ m}$$

$$\text{Req. time} = \frac{150}{10} = 15 \text{ sec}$$

S22. Ans.(b)

Sol.

Let the C.P. of pen & book be Rs.  $x$  & Rs.  $y$  respectively -

$$0.95x + 1.15y = (x + y) + 7$$

$$0.15y - 0.05x = 7 \dots\dots\dots(i)$$

and

$$1.05x + 1.1y = (x + y) + 13$$

$$0.05x + 0.1y = 13 \dots\dots\dots(ii)$$

from (i) & (ii)

$$y = 80Rs.$$

S23. Ans.(d)

Sol.

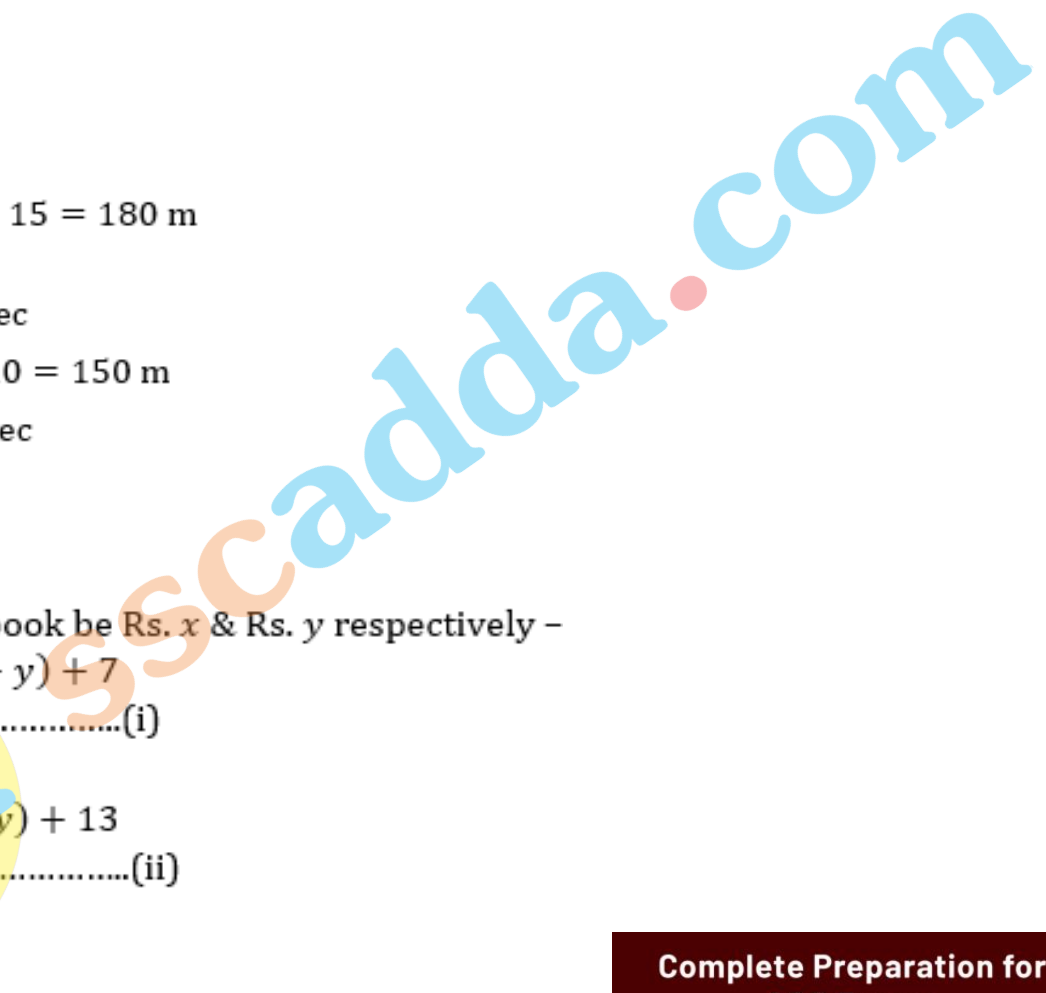
Let the cost price of article be  $x$

$$\text{S.P. of article} = 0.88x$$

$$\text{Marked price} = \frac{0.88}{80} \times 100 \times x = 1.1x$$

$$\text{New selling price of article} = 1.045x$$

$$\text{Profit percent} = \frac{1.045x - x}{x} \times 100 = 4.5\%$$



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**S24. Ans.(a)**

**Sol.**

let amount be x,

$$Px = x \left[ 1 + \frac{r}{100} \right] \Rightarrow P = 1 + \frac{r}{100}$$

$$qx = x \left[ 1 + \frac{r}{100} \right]^n \Rightarrow q = \left( 1 + \frac{r}{100} \right)^n$$

$$q = p^n$$

$$\log q = n \log p$$

$$n = \frac{\log q}{\log p}$$

**S25. Ans.(c)**

**Sol.**

Original student =  $n$

After 20 days

For  $n$  students food last for 10 days more.

$\therefore$  for  $(n + 500)$  students food last for 5 days

A.T.Q.-

$$10n = 5(n + 500)$$

$$n = 500$$

**S26. Ans.(a)**

**Sol.**

$$\text{Purchase price} = 0.9 \times 0.95 \times 2600 = 2223$$

Total cost incurred by mechanic on scooter

= Purchasing price + repairing cost

$$= (2223 + 477) = 2700$$

$$\text{S.P.} = 2835$$

$$\% \text{ profit} = \frac{2835 - 2700}{2700} \times 100 = 5\%$$

**S27. Ans.(b)**

**Sol.**

$$\tan \theta = \frac{\sin \alpha - \cos \alpha}{\sin \alpha + \cos \alpha}$$

Squaring both sides and adding 1.

$$1 + \tan^2 \theta = 1 + \frac{(\sin \alpha - \cos \alpha)^2}{(\sin \alpha + \cos \alpha)^2}$$

$$\sec^2 \theta = \frac{2(\sin^2 \alpha + \cos^2 \alpha)}{(\sin \alpha + \cos \alpha)^2}$$

$$= \frac{1}{\cos^2 \theta} = \frac{2}{(\sin \alpha + \cos \alpha)^2}$$

$$\Rightarrow \frac{1}{\cos \theta} = \frac{\pm \sqrt{2}}{(\sin \alpha + \cos \alpha)}$$

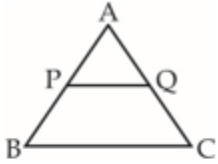
$$\Rightarrow \sin \alpha + \cos \alpha = \pm \sqrt{2} \cos \theta$$



S28. Ans.(b)

Sol.

In  $\Delta ABC$



$$\Delta ABC \sim \Delta APQ$$

$$\text{So, } \frac{AP}{AB} = \frac{PQ}{BC}$$

$$\frac{AP}{2AP} = \frac{5}{BC}$$

$$BC = 10 \text{ cm}$$

S29. Ans.(c)

Sol.

$$\text{Slant height} = \sqrt{5^2 + \left(\frac{10}{2\sqrt{3}}\right)^2} = \sqrt{25 + \frac{100}{12}} = \sqrt{\frac{100}{3}} = \frac{10}{\sqrt{3}} \text{ cm}$$

$$\text{Curved surface Area} = 3 \times \frac{1}{2} \times 10 \times \frac{10}{\sqrt{3}} = \frac{150}{\sqrt{3}} = 50\sqrt{3} \text{ cm}^2$$

S30. Ans.(b)

Sol.

$$\text{Total Surface area of a solid hemisphere} = 108\pi \text{ cm}^2$$

$$\Rightarrow 3\pi r^2 = 108\pi$$

$$r^2 = 36$$

$$r = 6 \text{ cm}$$

$$\begin{aligned} \text{Volume of hemisphere} &= \frac{2}{3}\pi r^3 = \frac{2}{3}\pi \times 216 = 2 \times 72\pi \\ &= 144\pi \text{ cm}^3 \end{aligned}$$

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