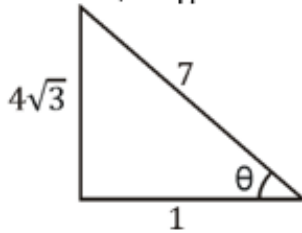


Quant Mega Quiz for SSC CGL Tier - 2 (Solutions)

S1. Ans.(c)

Sol.

$$\cos\theta = \frac{1}{7} = \frac{-B}{-H}$$



$$4\sqrt{3} + \frac{4\sqrt{3}}{7}$$

$$4\sqrt{3} \left(\frac{8}{7}\right) = \frac{32\sqrt{3}}{7}$$

S2. Ans.(d)

Sol.

$$N = \frac{89-1}{2} + 1 = 44 + 1 = 45$$

$$\text{Sum} = 45/2 = 22\frac{1}{2}$$

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S3. Ans.(c)

Sol.

$$\text{Cosec}\theta + \sin\theta = 4$$

$$(\text{cosec}\theta + \sin\theta)^2 = 16$$

$$\text{cosec}^2\theta + \sin^2\theta + 2 = 16$$

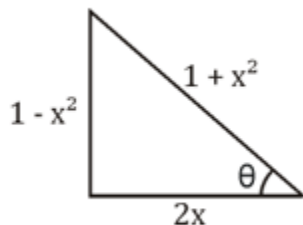
$$\text{cosec}^2\theta + \sin^2\theta = 14$$

$$\cot^2\theta - \cos^2\theta = 12$$

S4. Ans.(d)

Sol.

$$\sin^2\theta + \cos^2\theta = 1$$



$$\tan\theta = \frac{1-x^2}{2x}$$

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S5. Ans.(b)

Sol.

$$\cos\theta \left[\frac{\tan\theta + \sec\theta - (\sec^2\theta - \tan^2\theta)}{\tan\theta - \sec\theta + 1} \right]$$

$$\cos\theta \left[\frac{\tan\theta + \sec\theta(1 - \sec\theta + \tan\theta)}{\tan\theta - \sec\theta + 1} \right]$$

$$\cos\theta (\tan\theta + \sec\theta)$$

$$\cos\theta \left(\frac{1 + \sin\theta}{\cos\theta} \right) = 1 + \sin\theta$$

S6. Ans.(c)

Sol.

$$\operatorname{Cosec}^2\theta - \cot^2\theta = (6x)^2 - \frac{1}{(6x)^2}$$

$$1 = 36x^2 - \frac{1}{36x^2}$$

$$36x^2 + \frac{1}{36x^2} = \sqrt{(1)^2 + 4} = \sqrt{5}$$

S7. Ans.(a)

Sol.

$$a \sec\theta - b \tan\theta = c \quad \dots(i)$$

$$a \tan\theta - b \sec\theta = x \quad \dots(ii)$$

Square both equation and subtract

$$a^2 - b^2 = c^2 - x^2$$

$$x^2 = c^2 - a^2 + b^2$$

$$x = \sqrt{c^2 - a^2 + b^2}$$

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S8. Ans.(a)

Sol.

$$A + B = 90 \quad \sin^2 A + \sin^2 B = 1$$

$$\cos^2 A + \cos^2 B = 1$$

$$\sin^2 7\frac{1}{2} + \sin^2 82\frac{1}{2} + \cos^2 81\frac{1}{2} + \cos^2 8\frac{1}{2} = 1 + 1 = 2$$

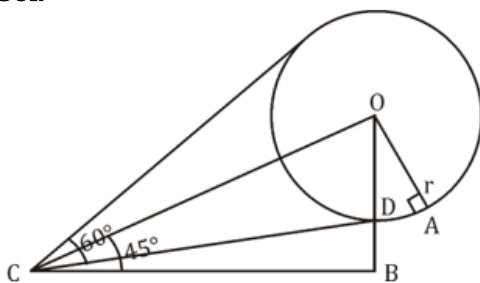
S9. Ans.(a)

Sol.

$$h = \sqrt{49 \times 121} = 7 \times 11 = 77\text{m}$$

S10. Ans.(d)

Sol.



$$\angle OCD = 30^\circ$$

$$\sin 30^\circ = \frac{14}{OC}$$

$$OC = 28$$

$$\sin 45^\circ = \frac{OB}{28} \Rightarrow OB = 14\sqrt{2} \text{ cm}$$

S11. Ans.(c)

Sol.

Sum of the ages of husband and wife at the time of their marriage
= (25×2) years. = 50 yrs.

Sum of the ages of husband and wife when their son was born
= $(50 + 2 \times 2)$ yrs. = 54 years.

$$\therefore \text{Age of Son} = \frac{(72 - 54)}{3} = \frac{18}{3} = 6 \text{ years.}$$

Hence, the couple got married $(6 + 2) = 8$ years ago.

S12. Ans.(d)

Sol. Since the total or average age of all the family members is not given, the given data is inadequate. So, the age of second child cannot be determined.

S13. Ans.(a)

Sol. Let the number of students with work experience be x and those without work experience be y .

$$\text{Then, } 18000x + 12000y = 16000(x + y)$$

$$\Rightarrow 2000x = 4000y$$

$$\Rightarrow \frac{x}{y} = \frac{2}{1}$$

\therefore Percentage of students with work experience

$$= \left(\frac{2}{3} \times 100\right)\% = 66.67\%$$

Percentage of students without work experience

$$= (100 - 66.67)\% = 33.33\%$$

S14. Ans.(a)

Sol. Total marks of six boys = $48 + 59 + 87 + 37 + 78 + 57 = 366$

$$\text{Required average} = \frac{366}{6} = 61$$

S15. Ans.(c)

Sol. Average weight of 75 girls = 47 kgs

Total weight of 75 girls = $47 \times 75 = 3525$ kg

Actual weight of 75 girls

$$3525 - 45 + 25 = 3525 - 20 = 3505 \text{ kg}$$

$$\therefore \text{Required average weight} = x = \frac{3505}{75} = 46.73 \text{ kg}$$

S16. Ans.(d)

Sol.

Distance covered by car in 2 hours

$$= \frac{300 \times 40}{100} = 120 \text{ km}$$

Remaining distance = 180 km

Remaining time = 2h

$$\text{Required speed} = \frac{180}{2} = 90 \text{ km/h}$$

$$\text{Speed of car} = \frac{120}{2} = 60 \text{ km/hr}$$

Required increase in speed = $90 - 60 = 30$ km/h

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S17. Ans.(c)

Sol.

$$\begin{aligned}\text{Stoppage time per hour} &= \frac{\text{Difference of speed}}{\text{Speed without Stoppage}} \\ &= \frac{64-48}{64} = \frac{16}{64} * 60 = 15 \text{ minutes}\end{aligned}$$

S18. Ans.(d)

Sol.

Let the journey be x km

According to question,

$$\begin{aligned}\frac{2}{15}x + \frac{9}{20}x + 10 &= x \\ \Rightarrow x &= 24 \text{ km.}\end{aligned}$$

S19. Ans.(a)

Sol. Distance travelled by goods train in 12 hours is equal to distance travelled by other train in 8 hours

$$12 \times x = 8 \times 72$$

$$x = 48 \text{ km/hr}$$

S20. Ans.(a)

Sol.

Let the speed of boat = a km/hr

Let the speed of stream = x km/hr

$$\frac{15}{a-x} + \frac{22}{a+x} = 5 \dots (i)$$

$$\& \frac{20}{a-x} + \frac{55}{2(a+x)} = \frac{13}{2}$$

$$\text{or } \frac{40}{a-x} + \frac{55}{a+x} = 13 \dots (ii)$$

(ii) - (i)

$$\frac{25}{a-x} + \frac{33}{a+x} = 8 \dots (iii)$$

Now, (i) $\times 3$

$$\frac{45}{a-x} + \frac{66}{a+x} = 15 \dots (A)$$

& $2 \times (iii)$

$$\frac{50}{a-x} + \frac{66}{a+x} = 16 \dots (B)$$

& eqn. (B) - (A)

$$\frac{5}{a-x} = 1 \text{ or } a-x = 5$$

$$\therefore a+x = 11$$

$$\text{So, } x = 3 \text{ km/hr}$$



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S21. Ans.(b)

Sol.

	Men	:	Women	:	Child
Work	5	:	3	:	2
Number	8	:	12	:	16
wage	40	:	36	:	32
	10	:	9	:	8

$$\text{Total wage of men} = 5400 \times \frac{10}{27} = 2000$$

$$\text{Total wage of women} = 5400 \times \frac{9}{27} = 1800$$

$$\text{Total wage of children} = 5400 \times \frac{8}{27} = 1600$$

$$\text{Wage of a man} = \frac{2000}{8} = 250$$

$$\text{Wage of a woman} = \frac{1800}{12} = 150$$

$$\text{Wage of a child} = \frac{1600}{16} = 100$$

Total wage of 10 man 12 women

$$= 10 \times 250 + 12 \times 150$$

$$= 2500 + 1800 = \text{Rs } 4300$$

S22. Ans.(b)

Sol.

Let total cost price $\Rightarrow 100x$

Selling price $\Rightarrow 120x$

$$2^{\text{nd}} \text{ selling price} \Rightarrow 70x + \frac{30x \times 150}{100}$$

$$= 115x \times \frac{120}{100} = 138x$$

Now,

$$138x - 120x = 450$$

$$18x = 450$$

$$x = 25 \text{ Rs.}$$

$$\text{Cost of packaging} = 25 \times 20 = 500 \text{ Rs.}$$

S23. Ans.(d)

Sol.

Let the present age of son be x yrs

\therefore present age of mother = $3x$ yrs

After 5 years

$$(3x + 5) = \frac{5}{2} (x + 5)$$

$$x = 25 - 10 = 15$$

10 years hence from present,

$$= \frac{3 \times 15 + 10}{15 + 10} = \frac{55}{25} = 2.2 \text{ times}$$



S24. Ans.(d)

Sol.

Let sum lent at 13% be Rs x

Therefore, sum lent at 17% be Rs (1250-x)

Atq,

$$\frac{x \times 13 \times 3}{100} + \frac{(1250 - x) \times 17 \times 3}{100} = 525$$

$$\frac{39x}{100} - \frac{51x}{100} + \frac{63750}{100} = 525$$

$$12x = 63750 - 52500$$

$$x = \text{Rs } 937.5$$

∴ sum lent at 13% is Rs 937.5

& lent at 17% is Rs 312.5

$$\therefore \text{required ratio} = \frac{937.5}{312.5} = 3 : 1$$

S25. Ans.(c)

Sol.

Curved surface area of hemisphere

$$= 2\pi r^2 = 308 \quad [r \rightarrow \text{radius of hemisphere}]$$

$$= 7 \text{ cm}$$

Height of cylinder (h) = 7 cm

$$\text{Radius of cylinder (R)} = \frac{7}{2} \times 3 = 3 \text{ cm}$$

Total surface area of cylinder

$$= 2\pi R (R + h)$$

$$= 2 \times 3 \times 10\pi = 60\pi \text{ cm}^2$$

S26. Ans.(a)

Sol.

Let speed of boat in still water = x km/hr

and speed of water current = y km/hr

So,

$$\frac{x-y}{y} = \frac{4}{1}$$

$$x - y = 4y$$

$$x = 5y$$

$$\frac{x}{y} = \frac{5}{1}$$

$$\text{So, } \frac{42}{5m+m} = T$$

$$6mT = 42$$

$$mT = 7$$

$$\frac{24}{4m} = (T - 1)$$

$$24 = 4mT - 4m \Rightarrow 24 = 28 - 4m$$

$$m = 1$$

speed of boat in still water = 5 × m km/hr = 5 km/hr

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S27. Ans.(d)

Sol.

Ratio of efficiency of A to B = 4 : 3

Ratio of efficiency of A : C = 5 : 4

Ratio of efficiency of

B : A : C

3 : 4

5 : 4

15 : 20 : 16

Let A, B and C does $20x$, $15x$ and $16x$ unit of work on each day.

Then in 2 day work completed by A and B = $35x \times 2 = 70x$

$29\frac{1}{6}\%$ of total work = $70x$

Total work = $\frac{70x}{\frac{175}{6}} \times 100$

= $\frac{70x \times 6}{175} \times 100$

= $240x$

Time taken by C alone to finish whole work = $\frac{240x}{16x} = 15$ days

S28. Ans.(c)

Sol.

Let length of train A, B and C be $10x$, $5x$ and $12x$ respectively

So, $\frac{10x+5x}{25} = 15$

$x = 25$

Let speed of train C be y m/sec

$\frac{10x+12x}{25-y} = 50$

$\Rightarrow 22x = 50 \times 25 - 50y$

$y = 14$ m/sec

S29. Ans.(d)

Sol.

Water removed from A = $\frac{Y}{3+Y} \times 75$

Milk removed from A = $\frac{3}{3+Y} \times 75$

Now, $\frac{\frac{3}{3+Y} \times 75}{75 + \frac{Y}{3+Y} \times 75} = \frac{3}{7}$

$\frac{75 \times 7}{3+Y} = 75 + \frac{75Y}{3+Y}$

$\frac{75 \times 7}{3+Y} - \frac{75Y}{3+Y} = 75$

$75 \times 7 - 75Y = 75 \times 3 + 75Y$

$75 \times 4 = 150Y + Y$

$Y = 2$

S30. Ans.(c)

Sol.

Required avg. = $\frac{30,000+18,000+15,000+15,000+12,000}{5}$

= $\frac{90,000}{5} = 18,000$

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