

Quant Mega Quiz for SSC Tier - 1 (Solutions)

S1. Ans.(a)

Sol.

Let total work 11.

(A + B)'s work = 7

Total (A + B + C)'s work = 11

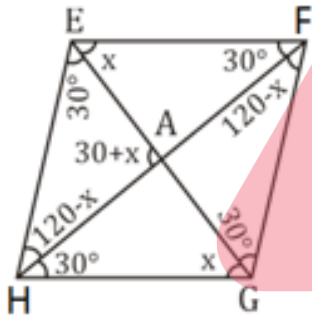
So, work done by C = 11 - 7 = 4

Total work of 1 unit = $\frac{550}{11} = \text{Rs. } 50$

So, share of C = 4 × 50 = 200

S2. Ans.(a)

Sol.



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Clearly, EFGH is a parallelogram

Assume angle AEF = x

Then we find other angles in terms of x

Now,

$\triangle AHE \sim \triangle FHG$

$$\Rightarrow \frac{EH}{HF} = \frac{AH}{FG}$$

$$\Rightarrow EH \times EH = AH \times 2AH$$

[EH = FG (opposite side of parallelogram) 2AH = HF (diagonal of parallelogram) bisect each other]

$$= \frac{EH}{AH} = \sqrt{2}$$

Using sin rule in $\triangle AEH$

$$\Rightarrow \frac{EH}{\sin(30+x)} = \frac{AH}{\sin 30}$$

$$\frac{EH}{AH} = \frac{\sin(30+x)}{\frac{1}{2}}$$

$$\sin(30+x) = \frac{\sqrt{2}}{2} = \frac{1}{\sqrt{2}} = 45$$

$$\angle EAF = 180 - 45 = 135$$

Required smaller angle = 45

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Useful for CGL, CHSL & others

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12 Months Validity*

S3. Ans.(c)

Sol.

Ratio of speed of $x : y = 1800 : 1500 = 6 : 5$

Ratio of speed of $y : z = 1200 : 1000 = 6 : 5$

Ratio of speeds of $x : y : z = 6 : 5$

$$\frac{6 : 5}{36 : 30 : 25}$$

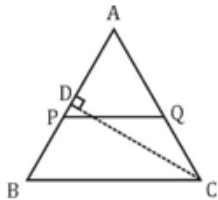
So, when x moves 36 meters, y moves 30 meters and z moves 25 meters.

In 1080-meter race when x moves 1080 meters Z only moves 750 meter. Thus, Z moves 330 meters less then.

To win just by 80 meter over z . A should give $330 - 80 = 250$ -meter startup to z

S4. Ans.(d)

Sol.



ΔABC ,

$CD = 6 \text{ cm} \Rightarrow AD = 8 \text{ cm}$

$AC^2 = CD^2 + AD^2 \Rightarrow AC = 10 \text{ cm}$

So, $PQ = \frac{1}{2} \times BC = 5 \text{ cm}$



S5. Ans.(a)

Sol.

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

So, $\cos^{12}\theta + 3\cos^{10}\theta + 3\cos^8\theta + \cos^6\theta - 1 = (\cos^4\theta + \cos^2\theta)^3 - 1$

$= (\sin^2\theta + \cos^2\theta)^3 - 1 = 1 - 1 = 0$

S6. Ans.(d)

Sol. All students height = $x.a$

10 students height = $10.b$

Remaining students height = $(x - 10).c$

ATQ,

$10.b + (x - 10).c = x.a \Rightarrow x = \frac{10(b-c)}{(a-c)}$

S7. Ans.(b)

Sol.

let $r_1 = x$ and

$r_2 = nx$

$V_1 = V_2$

$\frac{1}{3}\pi r_1^2 \cdot h_1 = \pi r_2^2 \cdot h_2$

$\frac{1}{3}\pi x^2 \cdot h_1 = \pi n^2 \cdot x^2 \cdot h_2$

$h_1 = 3.n^2 \cdot h_2$

S8. Ans.(d)

Sol.

$$S_6 = 42$$

$$\Rightarrow 6/2 (2a + 5d) = 42$$

$$\Rightarrow 2a + 5d = 14 \dots\dots(1)$$

$$\text{Now, } \frac{T_{10}}{T_{20}} = \frac{a+9d}{a+29d} = \frac{1}{3}$$

$$\Rightarrow a = d$$

\therefore from equation (1)

$$a = d = 2$$

$$\therefore T_{40} = 2 + 39 \times 2 = 80$$

S9. Ans.(d)

Sol.

$$B + 60\% \text{ of } A = 175\% \text{ of } B$$

$$\text{i.e. } 60\% \text{ of } A = 75\% \text{ of } B$$

$$\Rightarrow 0.6A = 0.75B$$

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

Apparently, it seems that A is bigger, but if you consider A and B to be negative the opposite would be true.

Hence option (d) is correct.

S10. Ans.(c)

Sol. Let the two-digit number be $10a+b$ and the number formed by reversing its digit be $10b+a$.

$$\frac{10a+b}{10b+a} = \frac{4}{7}$$

$$70a + 7b = 40b + 4a$$

$$\frac{a}{b} = \frac{1}{2}$$

So, let us list down all possible values for a and b.

(i) $a=1, b=2$, Number = 12 Reversed number = 21

(ii) $a=2, b=4$ Number = 24 Reversed number = 42

(iii) $a=3, b=6$ Number = 36 Reversed number = 63

(iv) $a=4, b=8$ Number = 48 Reversed number = 84

Hence, the sum of all the numbers would be,

$$12+21+24+42+36+63+48+84 = 330.$$

S11. Ans.(b)

Sol.

With reference to question

$$MP \times \frac{87}{100} = 7743$$

$$MP = \frac{7743 \times 100}{87}$$

SP if discount is 21%

$$S.P. = \frac{7743}{87} \times 100 \times \frac{79}{100} = \text{Rs. } 7031$$

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2020-21 Online Tests

S12. Ans.(c)

Sol.

$$\text{Total discount} = 850 \times 9 \times \frac{9}{100} + 1425 \times 17 \times \frac{15}{100} = 4322.25$$

$$d\% = \frac{4322.25}{850 \times 9 + 1425 \times 17} \times 100$$

$$d\% = \frac{4322.25}{31875} \times 100$$

$$D\% = 13.56\%$$

$$D\% \cong 14\%$$

S13. Ans.(c)

Sol.

$$H + C = 51250$$

$$D \times \frac{6}{5} = C \times \frac{17}{20}$$

$$D : C$$

$$17:24$$

$$\text{Horse} = \frac{17}{41} \times 64370 \Rightarrow \text{Rs. } 26690$$

S14. Ans.(b)

Sol.

$$\text{Speed without stoppage} = 80 \text{ km/hr}$$

$$\text{Speed with stoppage} = 60 \text{ km/hr}$$

$$\text{Stop per hour} = \frac{(\text{Speed without stoppage} - \text{Speed with stoppage})}{\text{Speed without stoppage}} \times 60$$

$$= \frac{80 - 60}{80} \times 60 = 15 \text{ min}$$

S15. Ans.(c)

Sol.

$$T = 4 \text{ year}$$

$$\text{S.I.} = 0.24x, \quad \text{Principle} = x$$

$$\text{S.I} = \frac{P \times T \times R}{100}$$

$$0.24x = \frac{x \times 4 \times R}{100}$$

$$R = 6\%$$

$$\text{C.I.} = \text{Amount} - \text{Principle}$$

$$\text{Amount} = 20000 \left[1 + \frac{6}{100} \right]^3 = 23820.32$$

$$\begin{aligned} \text{C.I.} &= 23820.32 - 20000 \\ &= 3820.32 \end{aligned}$$

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S16. Ans.(a)

Sol.

Let No. A, B, C

Let

C = 100 Then according to ques A is 40% lesser than C

A = 60

& B is 35% lesser than C

B = 65

No. should increase by $\frac{5}{60} \times 100 = 8\frac{1}{3}\%$

S17. Ans.(b)

Sol.

Suppose consumption = 10 liter

T. expenditure = $75 \times 10 = 750$

If Total expenditure ↑es by 10% = $\frac{750 \times 110}{100} = 825$

Now consumption of fuel = $\frac{825}{90} = \frac{27.5}{3}$ liter

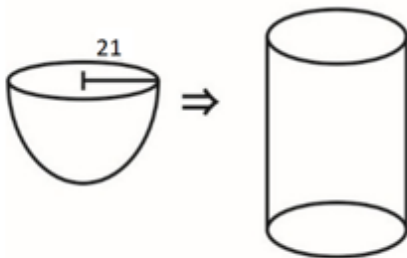
Consumption cut = $(10 - \frac{27.5}{3}) = \frac{2.5}{3}$ liter

= $\frac{2.5}{10} \times 100 = 8\frac{1}{3}\%$



S18. Ans.(c)

Sol.



Given with reference to question

$$\frac{\text{C. S. A. of cylinder}}{\text{T. S. A. of cylinder}} = \frac{12}{7}$$

$$\frac{2\pi r(r + h)}{2\pi r h} = \frac{12}{7}$$

$$\frac{r}{h} = \frac{5}{7} \dots \dots \dots (1)$$

$$\frac{r}{h} = \frac{5}{7} \dots \dots \dots (1)$$

Volume of hemi sphere = volume of cylinder

$$\frac{2}{3} \times \pi \times 21 \times 21 \times 21 = \pi \times r^2 \times \frac{7}{5} r \quad (\text{as from eq 1} \dots \dots h = \frac{7}{5} r)$$

$$r = \sqrt[3]{4410}$$

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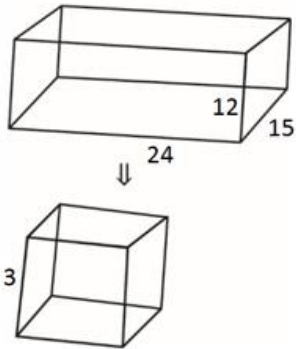


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S19. Ans.(d)

Sol.



$$\text{No. of cubes} = \frac{\text{volume of cuboid}}{\text{Volume of cube}} = \frac{24 \times 15 \times 12}{3 \times 3 \times 3} = 160 \text{ cubes}$$

$$\text{T.S.A. of 160 cubes} = 160 \times 6a^2$$

$$= 160 \times 6 \times 9$$

$$\Rightarrow 8640$$

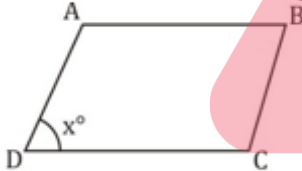
$$\text{T.S.A. of cuboid} = 2(12 \times 15 + 15 \times 24 + 12 \times 24) = 1656$$

$$\% \text{ increase} = \frac{(8640 - 1656)}{1656} \times 100 = 421.73\%$$

S20. Ans.(b)

Sol.

Let the ratio of angle D = x°



The sum of opposite angle of a cyclic quadrilateral = 180°

$$\therefore \angle A + \angle C = \angle B + \angle D$$

$$1 + 5 = 4 + x^\circ$$

$$\therefore x = 2$$

So the ratio of the angles = 1 : 4 : 5 : 2.

$$\therefore \angle D = \frac{180}{6} \times 2 = 60^\circ$$

S21. Ans.(a)

Sol.

Let speed of current is x km/hr

Atq,

$$\frac{182}{16+x} + \frac{182}{16-x} = 26$$

$$7(16-x) + 7(16+x) = 16^2 - x^2$$

$$7 \times 32 = 16^2 - x^2$$

$$x^2 = 256 - 224$$

$$x^2 = 32$$

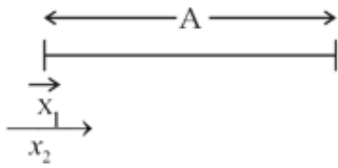
$$x = 4\sqrt{2}$$

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S22. Ans.(a)

Sol.



$$\text{Total time of travelling} = \frac{\text{Total distance}}{\text{Relative speed}} = \frac{2A}{x+y}$$

$$\text{Distance travelled by First boat} = \left(\frac{2A}{x+y}\right) \times x$$

$$\text{Distance travelled by Second boat} = \left(\frac{2A}{x+y}\right) \times y$$

S23. Ans.(c)

Sol.

Relative speed per hour in opposite direction = $9 + 7 = 16$ km/hr

Required distance = $16 \times 3 = 48$ km

S24. Ans.(c)

Sol.

$$\text{Police man's speed} = \left(\frac{2}{12} \times 60 \times \frac{5}{18}\right) \text{m/sec} = \frac{25}{9} \text{m/sec}$$

$$\text{Thief's speed} = \left(\frac{3}{21} \times 60 \times \frac{5}{18}\right) \text{m/sec} = \frac{50}{21} \text{m/sec}$$

$$\text{Time taken by policeman to overtake } T = \frac{200}{\frac{25}{9} - \frac{50}{21}} = 504 \text{ sec}$$

$$\text{In } T \text{ time, thief will cover} = 504 \times \frac{50}{21} = 1200 \text{ meter}$$

S25. Ans.(d)

Sol.

$43\bar{3} \times 45\bar{6} \times 43\bar{N}$ unit digit is $(N + 2)$

$$\Rightarrow 3 \times 6 \times N$$

$$\Rightarrow 8 \times N = N + 2$$

Check by option

$$N = 6$$

$$8 \times 6 = 6 + 2$$

$$4\overline{8} = \overline{8}$$

S26. Ans.(c)

Sol.

$$\because \frac{a^3 + b^3 + c^3 - 3abc}{a^2 + b^2 + c^2 - ab - bc - ca} = a + b + c$$

$$\text{So, } \frac{(1.5)^3 + (4.7)^3 + (3.8)^3 - 3 \times 1.5 \times 4.7 \times 3.8}{(1.5)^2 + (4.7)^2 + (3.8)^2 - 1.5 \times 4.7 - 4.7 \times 3.8 - 3.8 \times 1.5} \\ = 1.5 + 4.7 + 3.8 = 10$$

S27. Ans.(b)

Sol.

$$\begin{aligned}8 - \left[7 - \left\{x - \left(4 - \frac{7}{2}\right)\right\}\right] &= 5 \\ \Rightarrow 8 - \left[7 - \left\{x - \frac{1}{2}\right\}\right] &= 5 \\ \Rightarrow 8 - \left[\frac{15}{2} - x\right] &= 5 \\ \Rightarrow 8 - \frac{15}{2} + x &= 5 \\ \Rightarrow \frac{1}{2} + x &= 5 \Rightarrow x = 4.5\end{aligned}$$

S28. Ans.(a)

Sol.

$$\begin{aligned}N &= (12345)^2 + 12345 + 12346 \\ \text{Let } x &= 12345 \\ N &= (x)^2 + x + (x + 1) \\ N &= x^2 + 2x + 1 \\ N &= (x + 1)^2 \\ \sqrt{N} &= x + 1 \Rightarrow 12345 + 1 \Rightarrow \boxed{12346}\end{aligned}$$

S29. Ans.(c)

Sol. Numbers divisible by both 5 & 7 must be divisible by LCM of 5 and 7 ie 35.

∴ B/w 300 & 650, numbers divisible by 35 starts from 315 and ends at 630.

∴ total 10 numbers

S30. Ans.(b)

Sol. The number of prime numbers between 1 and 100 = 25

The number of prime numbers between 1 and 10 = 4

So, The number of prime numbers between 10 and 100 = 25 - 4 = 21

Among those 21 prime numbers 11, 13, 17, 31, 37, 73, 71, 79 & 97 remains prime when we interchange their digits.



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