# Quant Mega Quiz for SSC CGL Tier – 2 (Solutions)

**S1. Ans.(c)**

**Sol.** Let the initial quantity of solution be x lit

ATQ,

$$\frac{Sugar}{water} = \frac{\frac{x\times3}{8}-\frac{30x}{100}\times\frac{3}{8}}{\left(\frac{x\times5}{8}-\frac{30x}{100}\times\frac{5}{8}\right)+\frac{5x}{100}}$$

$$=\frac{21x\times80}{80\times39x}=7:13$$

**S2. Ans.(d)**

**Sol.** Let the investment of A, B and C be Rs. 3x , Rs. 5x and Rs. y. respectively

Therefore,

| A | B | C |
|---|---|---|
| 3x ×12 | 5x × 12 | y×6 |
| 36x | 60x | 6y |

ATQ,

60x = 6y ⇒ y = 10x

Required percentage = $\frac{3x}{10x}\times100 = 30\%$

**S3. Ans.(d)**

**Sol.** Let the speed of boat in still water be 5x km/hr and that of stream be 3x km/hr.

ATQ,

$$\frac{48}{8x}+\frac{48}{2x}=12$$

$$\Rightarrow \frac{48+192}{8x}=12$$

⇒ x = 2.5

Speed of boat in still water = 5x

= 12.5 km/hr

**S4. Ans.(a)**

**Sol.**

$$SI = \frac{pricple\times rate\times time}{100}$$

$$T = \frac{5040\times100}{12600\times8} = 5 \text{ year}$$

Amount in 2 year at CI = $12600\times\frac{7}{6}\times\frac{7}{6}$ = Rs. 17150

CI = Rs. 17150 – Rs. 12600 = Rs. 4550

**S5. Ans.(b)**

**Sol.**

ATQ,
Let present age of A, B, C, D be 6x, 8x, 11x and 15x years respectively.
$(6x - 4) + (8x - 4) + (11x - 4) + (15x - 4) = 64$
$40x = 80$
$x = 2$
Difference of present age of B and D is
$(15 - 8) \times 2 = 14$ years

**S6. Ans.(a)**

**Sol.**

Let radius of cylinder = x cm
And height of cylinder is 8x cm
Total surface area = $2\pi.x.8x + 2\pi x^2$
$= 2\pi.9x^2$
$= 18\pi x^2$ cm$^2$
If height of cylinder is reduced by $12\frac{1}{2}\%$
Then new total surface area
$= 2\pi x.7x + 2\pi x^2$
$= 2.\pi.8x^2$
$= 16\pi x^2$ cm$^2$
So, percentage change in total surface area of cylinder

$$= \frac{18\pi x^2 - 16\pi x^2}{18\pi x^2} \times 100$$

$$= \frac{2}{18} \times 100$$

$$= \frac{1}{9} \times 100 = 11\frac{1}{9}\%$$

**S7. Ans.(c)**

**Sol.**


ATQ, $5 \rightarrow 50$.
$1 \rightarrow 10$.
$2 \rightarrow 20$
Number of Girls = 20.

**S8. Ans.(d)**

**Sol.**

Let the CP be Rs. 100x

Then,

MP = $100x \times \frac{145}{100}$ = Rs. 145x

SP = $145x \times \frac{85}{100} \times \frac{88}{100}$ = Rs. 108.46x

ATQ,

8.46x = 126.9

$\Rightarrow$ x = 15

CP = Rs. 1500

SP at a profit of 15% = $1500 \times \frac{115}{100}$ = Rs. 1725.

**S9. Ans.(b)**

**Sol.**

Let efficiency of A and B per hour be a and b respectively.

Total work $\rightarrow$ (7.5a + 7.5b) × 4 = 30a + 30b

Now they work 4 hour in a day

Work done by A in one day

$= a + \frac{a}{2} + \frac{a}{4} + \frac{a}{8}$

$= \frac{15a}{8}$

Similarly,

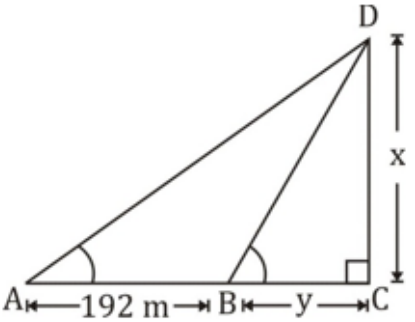
work done by B in one day $\Rightarrow \frac{15b}{8}$

Work done by both in

$\Rightarrow \frac{30a}{15a} \times 8 = 16$ days

**S10. Ans.(c)**

**Sol.**




Suppose height of the tower CD = x m

Let A and B be the points of observations.

And distance BC = y

$\tan A = \frac{5}{12}, \tan B = \frac{3}{4}$

Now in right angle ΔBCD

$\tan B = \frac{CD}{BC} \Rightarrow \frac{x}{y} = \frac{3}{4}$ ....(i)

Again in right angle Δ ACD

$\tan A = \frac{CD}{AC} \Rightarrow \frac{CD}{AB + BC} = \tan A$

$\Rightarrow \frac{x}{192 + y} = \frac{5}{12}$ ....(ii)

Dividing (i) and (ii) we get,

$\Rightarrow \frac{x}{y} \times \frac{192 + y}{x} = \frac{3}{4} \times \frac{12}{5}$

$\Rightarrow \frac{192 + y}{y} = \frac{9}{5} \Rightarrow 9y = 5(192 + y)$

$\Rightarrow 9y - 5y = 960 \Rightarrow 5y = 960 \therefore y = 240$ m.

Putting the value of y in (i) we get

$\frac{x}{240} = \frac{3}{4} \Rightarrow 4x = 720 \Rightarrow x = 180$

Hence height of the tower = 180 m.

**S11. Ans.(c)**

**Sol.**

No. of articles made in 1st hour = 80

No. of articles made in 2nd hour = $80 \times \frac{3}{4} = 60$

No. of articles made in 3rd hour = $60 \times \frac{7}{5} = 84$

No. of articles made in 4th hour = $84 \times \frac{2}{3} = 56$

No. of articles made in 5th hour = $56 \times \frac{8}{7} = 64$

Average = $\frac{80+60+84+56+64}{5} = \frac{344}{5} = 68.8$

**S12. Ans.(c)**

**Sol.**

Let 150 workers complete the work in x days.

$\therefore 150 \times x = 150 + 146 + ....$ to $(x + 8)$ terms

On putting x = 17

2550 = 150 + 146 + .... 25 (terms)

$= \frac{n}{2}[2a + (n-1)d]$, $n = 25$, $a = 150$, $d = -4$

$= \frac{25}{2}(300 - 96) = 2550$

L.H.S. = R.H.S.

Note: it is better to solve by options.

**S13. Ans.(c)**

**Sol.**

According to the formula,

$\frac{M_1 D_1 T_1}{W_1} = \frac{M_2 D_2 T_2}{W_2}$ [by technique 1]

Given $M_1 = 105,\ D_1 = 25,\ T_1 = 8,\ W_1 = \frac{2}{5}$

Now, let the additional men be x.

Then, $M_2 = 105 + x, T_2 = 9$

$D_2 = 25$

And $W_2 = 1 - \frac{2}{5} = \frac{3}{5}$

On putting these values in the above formula.

$\frac{105 \times 25 \times 8}{2/5} = \frac{(105 + x) \times 25 \times 9}{3/5}$

$= \frac{105 \times 8}{2} = \frac{(105 + x) \times 9}{3}$

$= 105 \times 4 = (105 + x) \times 3$

$= 105 \times 4 = 105 \times 3 + 3x$

$= 3x = 105$

$\therefore x = 35$ men

**S14. Ans.(c)**

**Sol.**

A.T.Q.

$x \times \frac{110}{100} \times \frac{120}{100} \times \frac{85}{100} = 56100$

$x = 50000$

**S15. Ans.(a)**

**Sol.**

$\frac{113 \times 4 - x \times 2}{13 \times 9 - 5 \times 7} = 5 \Leftrightarrow \frac{452 - 2x}{117 - 35} = 5 \Leftrightarrow \frac{452 - 2x}{82} = 5$

$\Leftrightarrow 452 - 2x = 410$

$\Leftrightarrow 2x = 452 - 410 = 42 \Leftrightarrow x = 21$

**S16. Ans.(c)**

**Sol.**

Given expression $= \frac{2700 - 240}{1120 + 110} = \frac{2460}{1230} = 2.$

**S17. Ans.(b)**

**Sol.**

$\sqrt{p} + \sqrt{q} + \sqrt{r} = \sqrt{10 + \sqrt{24} + \sqrt{40} + \sqrt{60}}$

$= \sqrt{(\sqrt{2})^2 + (\sqrt{3})^2 + (\sqrt{5})^2 + 2\sqrt{2 \times 3} + 2\sqrt{3 \times 5} + 2\sqrt{2 \times 5}}$

$= \sqrt{(\sqrt{2} + \sqrt{3} + \sqrt{5})^2} = \sqrt{2} + \sqrt{3} + \sqrt{5}$

So, p + q + r = 10

**S18. Ans.(c)**

**Sol.**

To find $a^3 + \frac{1}{a}$

$\Rightarrow \frac{a^4+1}{a}$

Given eqn. $a + a^2 + a^3 - 1 = 0$ ...(i)

Multiply eqn. (i) by (a) & then subtract eq 1from that equation

$a^2 + a^3 + a^4 - a = 0$

$\underline{-\ a + a^2 + a^3 - 1\ +}$

$a^4 - 2a + 1 = 0$

$\Rightarrow \frac{a^4+1}{a} = 2$

**S19. Ans (b)**

**Sol.**

If $\mathbf{x + \frac{1}{x} = \sqrt{3}}$,

Then, we have,

$\mathbf{x^6 = -1}$

$x^{48} + x^{(378/7)} + x^{(726/11)} + x^{60}$

$= x^{48} + x^{54} + x^{66} + x^{60}$

$= (x^6)^8 + (x^6)^9 + (x^6)^{11} + (x^6)^{10}$

$= 1 + (-1) + (-1) + 1 = 0$

**S20. Ans (d)**

**Sol.**

ATQ,

$\frac{x}{a} = \frac{y}{b} = \frac{z}{c} = k$ (let)

$\Rightarrow x = ak, y = bk, z = ck$

$\therefore \frac{ax-by}{(a+b)(x-y)} + \frac{by-cz}{(b+c)(y-z)} + \frac{cz-ax}{(c+a)(z-x)}$

$= \frac{a^2k-b^2k}{(a+b)(ak-bk)} + \frac{b^2k-c^2k}{(b+c)(bk-ck)} + \frac{c^2k-a^2k}{(c+a)(ck-ak)}$

$= \frac{a^2-b^2}{(a+b)(a-b)} + \frac{b^2-c^2}{(b+c)(b-c)} + \frac{c^2-a^2}{(c+a)(c-a)}$

$= \frac{a^2-b^2}{a^2-b^2} + \frac{b^2-c^2}{b^2-c^2} + \frac{c^2-a^2}{c^2-a^2} = 3$

**S21. Ans.(d)**

**Sol.**

Ratio of investment

$= \quad R \quad : \quad S$

$\begin{bmatrix} 40{,}000\times1 & : & 75{,}000\times2 \\ +50{,}000\times1 & & \\ +60{,}000\times1 & & \\ +70{,}000\times1 & & \end{bmatrix}$

= 2,20,000 : 1,50,000
= 22 : 15
Profit = Rs. 3,70,000
According to the question
37r → 370,000
1r → 10,000
Ramesh share
22r = 2,20,000

**S22. Ans.(d)**

**Sol.**

50000 : 70000
5 : 7
According to the question

$$\frac{30}{100} \times 7x - \frac{30}{100} \times 5x = 90$$

$$\frac{30}{100} \times 2x = 90 \text{ or } x = \frac{90 \times 100}{30 \times 2}$$

x = 150
5x + 7x = 12x
12 × 150 = 1800

**S23. Ans.(a)**

**Sol.**

Let the investment made by A is Rs. x
A → x
B → 2x after 6 months
C → 3x after 8 months
Ratio of investments
x × 12 : 2x × 6 : 3x × 4
1 : 1 : 1
According to the question,
Profit → 36,000
3r → 36,000
C's share → 12,000

**S24. Ans.(a)**

**Sol.** When we change shape of a solid figure, volume remains constant,

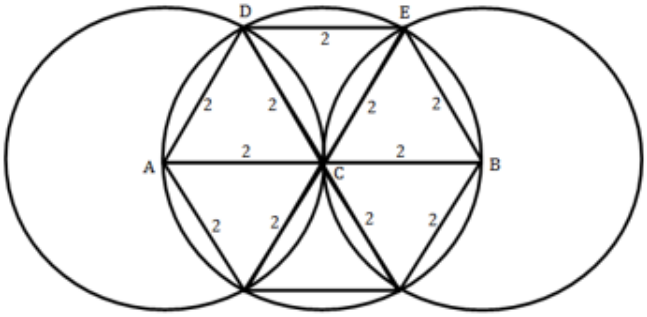
∴ Volume Hemisphere = Volume of cone

$$\frac{2}{3}\pi R^3 = \frac{1}{3}\pi R^2 h$$

∴ 2R = h

**S25. Ans.(b)**

**Sol.**




Quadrilateral ABDE has 3 equilateral triangles and the side of the equilateral triangle is 2 unit then the area of ABDE = the area of 3 Equilateral triangles

$$\text{area of ABDE} = 3 \times \frac{\sqrt{3}}{4} \times 2 \times 2$$

$$= 3\sqrt{3}$$

**S26. Ans.(a)**

**Sol.**

According to question,

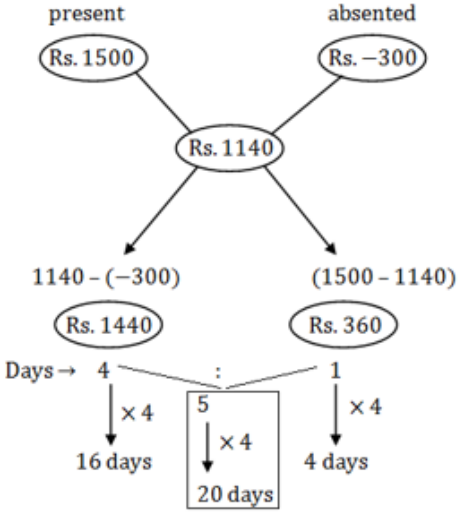
| | CP | | SP | |
|---|---|---|---|---|
| I | 4 | —— | 5 | (25% profit first time) |
| II | 4 | —— | 5 | |
| II | 4 | —— | 5 | |
| | 64 | | 125 | |
| | ×2 | | ×2 | |
| | 128 | | 250 (Given) | |

∴ CP = Rs. 128

**S27. Ans.(c)**

**Sol.**

If laborer had come for 20 days
he would have earned Rs. = 20 × 75 = 1500
If laborer had absented for 20 days
he would have earned fined for 20 × 15 = Rs. 300



**S28. Ans.(b)**

**Sol.**

Sum of P and Q = 5050 × 2 = 10100

Sum of Q and R = 6250 × 2 = 12500

Sum of P and R = 5200 × 2 = 10400

$(P + Q + R) = \frac{33000}{2} = 16500$

Monthly income of P = 16500 – 12500 = 4000

**S29. Ans.(c)**

**Sol.**

Let total students = 100

Students passed in half yearly exam = 70

Students failed in half yearly exam = 30

Students passed in yearly Exam $= 70 \times \frac{60}{100} = 42$

Students passed in yearly exams who failed in half yearly exam

$= 30 \times \frac{80}{100}$

= 24

Total students passed in yearly Exam = 42 + 24 = 66

% passed $= \frac{66}{100} \times 100$

= 66%

**S30. Ans.(a)**

**Sol.**

Let total quantity be 100

Alcohol = 40

Ist vessel

$\frac{40 + x}{100 + x} = \frac{1}{2}$

80 + 2x = 100 + x

x = 20 ml

2nd vessel

$\frac{40 - \frac{2}{5}y + y}{100 - \frac{3}{5}y + y} = \frac{1}{2}$

$\frac{40 + \frac{3y}{5}}{100 + \frac{2y}{5}} = \frac{1}{2}$

$\frac{200 + 3y}{500 + 2y} = \frac{1}{2}$

400 + 6y = 500 + 2y

4y = 100

y = 25

$\% = \frac{5}{25} \times 100$

= 20%