

Quant Mega Quiz for SSC Tier-1 (Solutions)

S1. Ans.(d)

Sol.

$$12 \rightarrow 16\%$$

$$1 \rightarrow \frac{16}{12}\%$$

$$3 \rightarrow \frac{16}{12} \times 3 = 4\%$$

$$PR = \frac{15625}{25} = 625; PR^2 = \frac{15625}{25 \times 25} = 25, PR^3 = \frac{15625}{25 \times 25 \times 25} = 1$$

$$3 \times 625 = 1875$$

$$3 \times 25 = 75$$

$$1 \times 1 = 1$$

$$= 1951 \text{ Rs}$$

S2. Ans.(b)

Sol.

$$B = x \text{ days}, \quad A = (x+7) \text{ days}, \quad C = (x-9) \text{ days}$$

ATQ,

$$\frac{1}{x} + \frac{1}{x+7} = \frac{1}{x-9}$$

$$(x+7+x)(x-9) = x^2 + 7x$$

$$= x^2 - 18x - 63 = 0$$

$$X = 21 = B$$

$$A = 28$$

$$C = 12 \text{ days}$$

S3. Ans.(d)

Sol.

$$\frac{4x^2 - 3y^2}{2x^2 + 5y^2} = \frac{12}{19}; \frac{4x^2 - 3y^2}{4x^2 + 10y^2} = \frac{12}{38}$$

Using C & D

We get

$$\frac{8x^2 + 7y^2}{13y^2} = \frac{50}{26}$$

$$\frac{8x^2}{13y^2} = \frac{36}{26}, x:y = 3:2$$

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S4. Ans.(c)

Sol.

$$\sqrt{xy} = \frac{xy^2}{x}$$

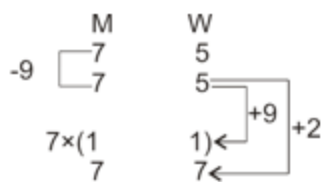
$$xy = \frac{x^2y^4}{x^2}$$

$$x^3 = x^2y^3$$

$$x:y = x^{\frac{2}{3}} : 1$$

S5. Ans.(a)

Sol.



2 → 9 ltr.

1 → 4.5 ltr

$$14 \rightarrow 14 \times \frac{9}{2} = 63 \text{ lt}$$

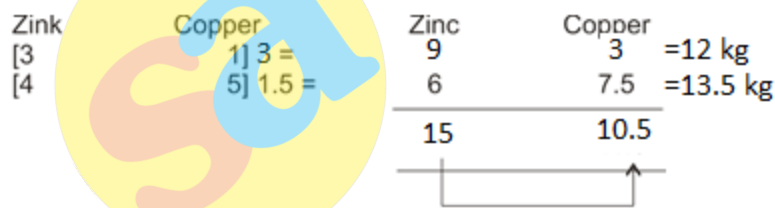
$$\text{Initial quality of milk} = \frac{63}{12} \times 7$$

$$= \frac{21}{4} \times 7$$

$$= \frac{147}{4} = 36.75 \text{ lt}$$

S6. Ans.(b)

Sol.



Pure copper = 4.5  
Resultan alloy = 15+15=30kg

S7. Ans.(c)

Sol.

$$3^{3^{334}} = 3^{3 \times 3^{333}} = (3^{3^{333}})^3 \text{ as } a^{bc} = (a^b)^c$$

$$\Rightarrow [(3^{3^{333}})^3 + 1^3] \text{ will have a factor} = 3^{3^{333}} + 1$$

$$\text{Greatest common divisor} = 3^{3^{333}} + 1$$

S8. Ans.(d)

Sol.

$$\left[ 8 \div \left\{ 4 \div \left( \frac{1}{2} - \left( \frac{1}{16} \right) \right) \right\} + 1 \right]$$
$$8 \div \left[ 4 \div \left( \frac{7}{16} + 1 \right) \right] = 8 \div \frac{4 \times 16}{23}$$
$$= \frac{8 \times 23}{4 \times 16} = \frac{23}{8}$$

S9. Ans.(c)

Sol.

$$PB = 32$$

$$PA = 18$$

Let the radius = r

$$32 \times 18 = (26+r)(26-r)$$

$$32 \times 18 = 26^2 - r^2$$

$$r^2 = 26^2 - 32 \times 18$$

$$= 676 - 576$$

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

S10. Ans.(b)

Sol.

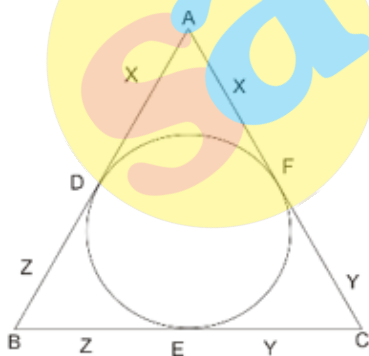
$$\operatorname{cosec} \theta = \frac{5}{4}$$

$$\frac{4 \times \frac{4}{3} - 5 \times \frac{3}{5} + 1}{\frac{5}{3} + 4 \times \frac{3}{4} - 1} =$$

$$\frac{\frac{16}{3} - 3 + 1}{\frac{5}{3} + 2} = \frac{\frac{16}{3} - 2}{\frac{11}{3}} = \frac{10}{11}$$

S11. Ans.(b)

Sol.



$$AD = AF$$

$$FC = EC$$

$$x + y = 11 \quad (1)$$

$$z + y = 9 \quad (2)$$

$$x + z = 13 \quad (3)$$

$$\text{from (2) \& (3) } x - y = 4 \Rightarrow AD - CE = 4$$

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S12. Ans.(d)

Sol.

$$a) \sin 60^\circ = \frac{OA}{AD}$$

$$\Rightarrow 3AD^2 = 4OA^2$$

$$c) \cos 60^\circ = \frac{DO}{AD}$$

$$\frac{1}{4} = \left(\frac{DO}{AD}\right)^2$$

b) is a property

S13. Ans.(c)

Sol.

$$pr+pr+pr^2 = 600$$

$$Pr+pr+pr+3pr^2+pr^3 = 938$$

$$2pr+pr^2 = 600 \quad (1)$$

$$3pr+3pr^2+pr^3 = 938 \quad (2)$$

$$Pr+2pr^2+pr^3 = 338$$

$$2pr+pr^2 = 600$$

$$\text{Dividing both} = \frac{1+2r+r^2}{2+r} = \frac{169}{300}$$

$$300+600r+300r^2 = 338+169r$$

$$300r^2+431r-38 = 0$$

$$r = \frac{50}{2 \times 300} = \frac{100}{12} \% = \frac{25}{3} \%$$

$$= 8\frac{1}{3} \%$$

S14. Ans.(b)

Sol.

$$a^{\frac{1}{3}} = x$$

$$b^{\frac{1}{3}} = y$$

$$c^{\frac{1}{3}} = z$$

$$a = x^3, b = y^3, c = z^3$$

$$\Rightarrow x + y + z = 0$$

$$(x^3 + y^3 + z^3)^6$$

$$= (3xyz)^6 = 729x^6y^6z^6$$

$$= 729a^2b^2c^2$$

**S15. Ans.(d)**

**Sol.**

$$4(x-y) = 3(x+y)$$

$$4x - 4y = 3x + 3y$$

$$x = 7y$$

$$y = \frac{1}{7}x$$

$$k = \frac{100}{7}$$

$$\text{ATQ} = \frac{100}{7} \times \frac{21}{100} = 3$$

**S16. Ans.(d)**

**Sol.**

$$\begin{array}{r} 3 \ 5 \\ 2 \ 3 \\ \hline 8 \ 7 \end{array} \left. \begin{array}{l} \rightarrow 10-9 \rightarrow 1 \\ \rightarrow 24-14 = 10 \end{array} \right\} \downarrow$$

$$= \text{ratio} = 30 : 50$$

$$10 \text{ added} = 40 : 60 = 2 : 3$$

**S17. Ans.(b)**

**Sol.**

$$\alpha = 0;$$

$$= 2\sin^2 \beta + 4\cos \beta \sin 0 \sin \beta + \cos 2\beta$$

$$= 2\sin^2 \beta + 1 - 2\sin^2 \beta = 1$$

$$\alpha = 90^\circ;$$

$$2\sin^2 \beta - 4\sin \beta \sin \beta - \cos 2\beta$$

$$-2\sin^2 \beta - 1 + 2\sin^2 \beta = -1$$

$$\text{If } \beta = 0$$

$$= \cos 2\alpha$$

**S18. Ans.(b)**

**Sol.**

$$\text{for } \theta = 0$$

we are getting

$$\cos^2 \cos 0 + \sin^2 \sin 0 = \cos^2 1$$

$$\text{for } \theta = 90$$

we are getting

$$1 + \sin^2 1$$

**S19. Ans.(c)**

**Sol.**

$$\operatorname{cosec} Y = \frac{1}{2} \quad \text{Not possible}$$

$$\operatorname{Sec} \alpha = \frac{1}{4} \quad \text{Not possible}$$

$$\operatorname{Cosec} y, \operatorname{sec} \alpha \text{ range } (-\infty, -1] \cup [1, \infty)$$

$$\operatorname{Cos} \delta = 2 \quad \text{Not possible range } [-1, 1]$$

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**S20. Ans.(b)****Sol.** Let the length be x,y

$$x + y = 12$$

$$2\pi r + 8r = 12$$

$$r = \frac{6}{\pi+4}$$

**S21. Ans.(c)****Sol.**

$$\text{LCM of } 9,13,17,38 = 38 \times 17 \times 13 \times 9$$

$$646 \times 117 = 75582$$

75582N+7 be the number

ATQ,

$$(75582+7)/11 = \text{remainder} = 8$$

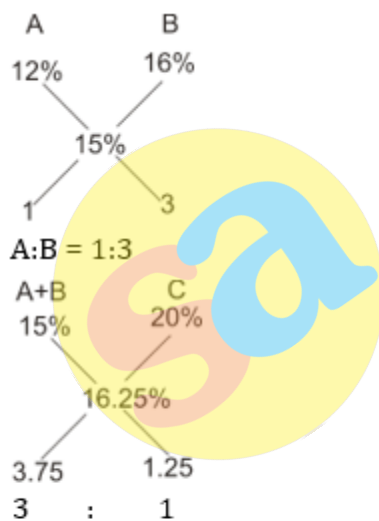
$$\Rightarrow N = 1$$

$$\text{Number} = 75582+7 = 75589$$

$$\text{Sum of digits} = 7+5+5+8+9 = 34$$

**S22. Ans.(d)****Sol.**

$$\frac{-11}{2} \times \frac{15}{16} \times \frac{11}{34} \times \frac{2}{15} = \frac{-121}{544}$$

**S23. Ans.(a)****Sol.**

$$[A : B = 1 : 3]3 = 3 : 9$$

$$[A + B : C = 3 : 1]4 = 12 : 4$$

$$A : B : C = 3 : 9 : 4$$

$$A + B + C = 80$$

$$3n + 9n + 4n = 80$$

$$n = 5$$

$$15, 45, 20$$

**S24. Ans.(c)****Sol.** Let the sides be a, b, c

$$a^2+b^2 = 13^2 \quad (1)$$

$$b^2+c^2 = 281 \quad (2)$$

$$a^2+c^2 = 20^2 \quad (3)$$

Total surface area=  $2(ab+bc+ca)$ 

Solving 1,2 &amp; 3 we get

A,b,c = 5,12,16 units respectively

Surface area =

$$= 2(5 \times 12 + 12 \times 16 + 16 \times 5)$$

$$= 2(60 + 192 + 80)$$

$$= (332)2 = 664 \text{ units}$$

**S25. Ans.(d)****Sol.** Total score =  $42 \times 30$ Total score-(smallest + largest)=  $40 \times 28$ 

$$42 \times 30 - 40 \times 28 = \text{smallest} + \text{largest}$$

$$100 = \text{largest} - \text{smallest}$$

$$\text{Largest} + \text{smallest} = (40+2)(28+2) - 40 \times 28$$

$$-40 \times 28 + 40 \times 28 + 56 + 80 + 4 = \text{largest} + \text{smallest}$$

$$140 = \text{largest} + \text{smallest}$$

$$100 = \text{largest} + \text{smallest}$$

$$120 = \text{largest}$$

$$20 = \text{smallest}$$

**S26. Ans.(d)****Sol.**

$$\text{discount} = 10\% = (\text{mp} = 10; \text{sp} = 9)$$

$$\text{Loss} = 1\% = \text{cp} = 100, \text{sp} = 99$$

Mp-	Sp	cp
110	99	100

8% profit

$$\Rightarrow \text{SP} = 108$$

Discount = 10%

$$10 = \frac{\text{MP} - \text{SP}}{\text{MP}} \times 100$$

$$\frac{1}{10} = \frac{\text{MP} - 108}{\text{MP}}$$

$$\frac{1}{10} = 1 - \frac{108}{\text{MP}}$$

$$\frac{108}{\text{MP}} = \frac{9}{10}$$

$$\text{MP} = 120$$

$$\text{Increased MP} = \frac{120 - 110}{110} \times 100$$

$$= \frac{100}{11} \%$$

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S27. Ans.(a)

Sol.

$$\text{loss} = 36\%$$

$$\Rightarrow \text{CP} = 100$$

$$\text{SP} = 64 \rightarrow 360$$

$$\text{CP} = \frac{360}{64} \times 100 \text{ for 140 articles}$$

$$\Rightarrow \text{CP of 1 article} = \frac{360 \times 100}{64 \times 140}$$

$$\text{SP of 1 article at 54\% profit} = \frac{360 \times 100}{64 \times 140} \times \frac{154}{100} \text{ Rs}$$

Number of article for Rs 198

$$= \frac{198 \times 64 \times 140 \times 100}{360 \times 100 \times 154}$$

$$= 32$$

S28. Ans.(b)

Sol.

$$\text{curved surface area} = 2\pi rh$$

$$\text{Ratio} = r_1 h_1 : r_2 h_2$$

$$= 8 \times 5 : 15 \times 4$$

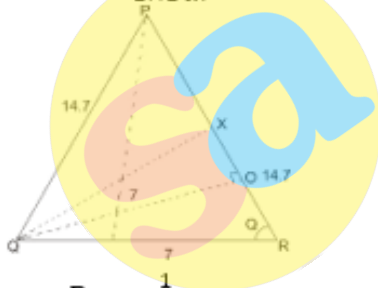
$$= 2:3$$

S29. Ans.(b)

Sol.

Applying cosine rule in PQR,

$$\cos R = \frac{7}{2 \times 14.7}$$



$$\cos R = \frac{1}{2 \times 2.1}$$

$$\cos R = \frac{10}{42} = \frac{5}{21}$$

$$\cos X = \frac{OX}{QX}$$

$$\frac{5}{21} = \frac{OX}{7}$$

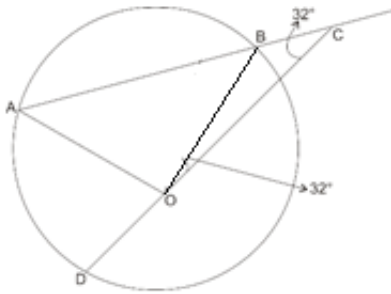
$$OX = \frac{5}{3}$$

$$XR = \frac{10}{3} \text{ cm}$$



S30. Ans.(b)

Sol.



$$\angle BCO = \angle BOC = 32^\circ$$

$$\angle OBC = 180^\circ - 64^\circ$$

$$= 116^\circ$$

$$\angle OBA = 64^\circ$$

$$\angle OAB = 64^\circ$$

$$\angle AOB = 180^\circ - 128^\circ = 52^\circ$$

$$\angle AOD = 180^\circ - 52^\circ - 32^\circ = 96^\circ$$

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