Quant Mega Quiz for SSC Tier – 1 (Sol utions)

S1. Ans.(a)

Sol .

Profit ratio = Investment ×time

$X : Y = 80{,}000 \times 2 : 100000 \times \frac{3}{2}$

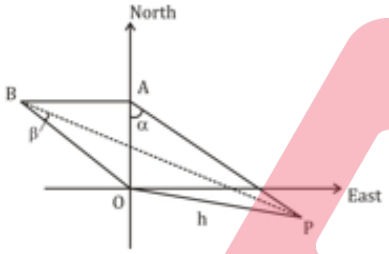
$= 16 : 15$

S2. Ans.(a)

Sol .

$\Delta OAP,$

$\tan\alpha = \frac{h}{OA}$.....(i)



$\Delta OBP,$

$\tan\beta = \frac{h}{OB}$ .....(ii)

$\Delta OAB,$

$OB^2 = OA^2 + AB^2$

$AB^2 = h^2\cot^2\beta - h^2.\cot^2\alpha$

$AB^2 = h^2.[cosec^2\beta - cosec^2\alpha]$

$AB^2 = h^2.\left[\frac{\sin^2\alpha - \sin^2\alpha}{sin^2\alpha.\sin^2\beta}\right]$

$$h = \frac{AB.\sin\alpha.\sin\beta}{\sqrt{\sin^2\alpha - \sin^2\beta}}$$

S3. Ans.(c)

Sol .

Sum of all one digit & two digit numbers

$1 + 2 + 3 + \ldots\ldots\ldots\ldots + 99.$

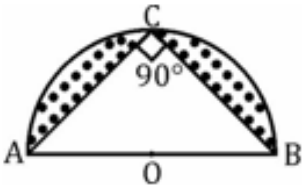
$= \frac{n(n+1)}{2} = \frac{99 \times 100}{2} = 99 \times 50$

$\text{Avg} = \frac{99 \times 50}{99} = 50$

S4. Ans.(b)

Sol .

$\angle ACB = 90°$



AC=CB=x cm

$AB = 14\ cm$

From ΔABC

$x^2 + x^2 = 14^2$

$x = 7\sqrt{2}$ cm

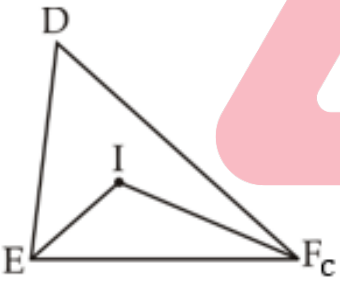
$\because$ Area of $\Delta ABC = \frac{1}{2} AC.\ BC = \frac{1}{2}.7\sqrt{2}.7\sqrt{2} = 49$ sq. cm.

Area of semi-circle$= \frac{\pi r^2}{2} = \frac{22}{7\times 2} \times 7 \times 7 = 77$ sq. cm.

Area of shaded region=77-49=28 sq. cm

S5. Ans.(c)

Sol .



$\angle EIF = 90° + \frac{1}{2}\angle EDF$

$= 90 + \frac{1}{2} \times 110$

$= 145°$

S6. Ans.(a)

Sol .

We have $= \frac{1}{3.197} = 0.3127$

then,

$$\frac{1}{0.0003197} = \frac{1}{3.197} \times 10000$$

$=0.3127\times 10000$

$= 3127$

S7. Ans.(a)

Sol .

Let cp of Cow = x

Cp of Goat = 2500 – x

According to question

$x \times 1.2 = (2500 - x) \times 1.3$

$2.5x = 2500 \times 1.3$

$x = 1300$

CP of goat = 2500 – 1300 = 1200 Rs.

S8. Ans.(c)

Sol .

Let take CP = 100 and successive discount 10, 15 and 20%

So $SP = 100 \times \frac{90}{100} \times \frac{85}{100} \times \frac{80}{100}$

$SP = \frac{18 \times 17}{5} = 61.2$

Hence discount = 100 – 61.2 = 38.8%

S9. Ans.(b)

Sol .

4x + 3y =0 & 7x + 5y = 0

x	0	–3
y	0	4

&

x	0	5
y	0	–7

Clearly, given lines intersect only at one point i.e. origin.

S10. Ans.(c)

Sol .

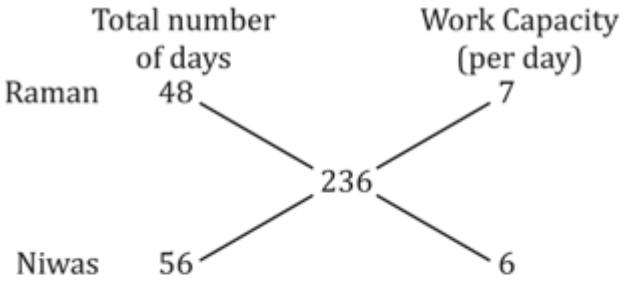
In cyclic quadrilateral □PRQT

∠PRQ + ∠PTQ = 180°

∠PTQ = 130°

S11. Ans.(b)

Sol .



ATQ,

$13 \times 5 + x \times 9 = 236$

$9x = 171$

$\boxed{x = 19}$

Working capacity of Dev = 19 – 7 – 6 = 6

Niwas's profit share

$= \frac{7080}{236} \times (14 \times 6)$

= 2520

S12. Ans. (c)

Sol .

$$\left[\frac{\cos^2 A\,(\sin A + \cos A)}{\operatorname{cosec}^2 A(\sin A - \cos A)} + \frac{\sin^2 A\,(\sin A - \cos A)}{\sec^2 A(\sin A + \cos A)}\right](\sec^2 A - \operatorname{cosec}^2 A)$$

$$\Rightarrow \sin^2 A.\cos^2 A\left[\frac{(\sin A+\cos A)^2+(\sin A-\cos A)^2}{\sin^2 A-\cos^2 A}\right]\frac{\sin^2 A-\cos^2 A}{\sin^2 A.\cos^2 A}$$

$$\Rightarrow 2$$

S13. Ans.(a)

Sol .

First 111 whole number

[0 + 1 + 2 ..... 110]

$$Sum = \frac{n(n+1)}{2} = \frac{110 \times 111}{2} = 55 \times 111$$

= 6105

S14. Ans.(b)

Sol .

We have,

$(1+a^2)\,x^2 + 2abx + (b^2-c^2) = 0$

for equal roots

$\Rightarrow B^2 - 4AC = 0$

$\Rightarrow 4a^2b^2 - 4(1+a^2)\,(b^2-c^2) = 0$

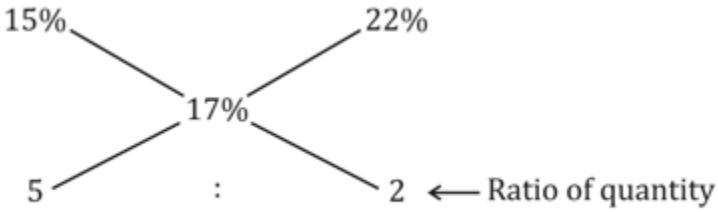
$\Rightarrow 4a^2b^2 - 4b^2 - 4a^2b^2 + 4c^2 + 4a^2c^2 = 0$

$\Rightarrow 4c^2\,(1+a^2) = 4b^2$

$\Rightarrow c^2\,(1+a^2) = b^2$

S15. Ans.(c)

Sol .



Required quantity = $\frac{511}{7} \times 2 = 146$

S16. Ans.(b)

Sol .

$$\sqrt[r]{\frac{3^{2r+\frac{1}{2}}.3^{\frac{1-r}{2}}}{3^{1-\frac{r}{2}}}} = \sqrt[r]{\frac{3^{\frac{4r+1+1-r}{2}}}{3^{\frac{2-r}{2}}}} = \sqrt[r]{3^{2r}}$$

$$= 3^{2r/r} = 3^2 = 9$$

S17. Ans.(a)

Sol .

Average speed (in meters/second)

$$= \frac{1200}{15} \times \frac{5}{18} = \frac{200}{9}\ m/s$$

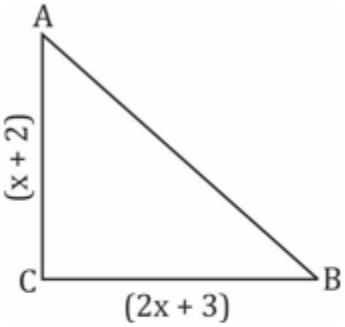
S18. Ans.(c)

Sol .

Area of right angle triangle

$$= \frac{(x+2)\times(2x+3)}{2} = 60$$

$$\Rightarrow 2x^2 + 7x - 114 = 0$$



Solving the above quadratic equation, we get

x = 6

∴ x + 2 = 8 cm

And 2x + 3 = 15 cm

∴ Hypotenuse AB = $\sqrt{(8)^2 + (15)^2} = 17$ cm

(Using Pythagoras theorem)

S19. Ans.(a)

Sol .

Profit share ratio

	Arun		Chiru		Dev
⇒	20000×12	:	25000×8	:	30000×5
	4×12	:	5×8	:	30
	24	:	20	:	15

Chiru's share = $\frac{53690}{59} \times 20 = 18200$

S20. Ans.(b)

Sol .

Shirts sold in January = 7000

Shirts sold in April = 5500

Required difference = 1500

S21. Ans.(b)

Sol .

ATQ,

$1 \times 2x + \frac{1}{2} \times 3x + \frac{1}{4} \times 4x = 216$

$2x + \frac{3x}{2} + x = 216$

$\frac{9x}{2} = 216$

x = 48

Number of 50 paise coin = 48 × 3 = 144

S22. Ans.(c)

Sol .

Quantity of water is given mixture = $\frac{1}{5}$

Quantity of water in resultant mixture = $\frac{2}{5}$

Using Alligation

$$\begin{array}{ccc} \frac{1}{5} & & 1 \\ & \frac{2}{5} & \\ \hline 1-\frac{2}{5} & : & \frac{2}{5}-\frac{1}{5} \end{array}$$

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

3 : 1

3r → 45 litres

1r → 15 litres

S23. Ans.(a)

Sol .

Profit's Ratio = 4500 × 12 : 3000 × x

= 54 : 3x

= 18 : x

$\frac{18}{x} = \frac{2}{1}$

x = 9 months

B joined after = 12 – 9 = 3 months

S24. Ans.(d)

Sol .

ATQ,

$\frac{1}{12} + \frac{1}{15} - \frac{1}{x} = \frac{1}{20}$

$\frac{1}{x} = \frac{1}{12} + \frac{1}{15} - \frac{1}{20}$

$\frac{1}{x} = \frac{5 + 4 - 3}{60}$

$\frac{1}{x} = \frac{6}{60}$

x = 10 min

S25. Ans.(c)

Sol .

Work done by 12 men in 6 days = $\frac{6}{18} = \frac{1}{3}$

Remaining work = $1 - \frac{1}{3} = \frac{2}{3}$

$12 \times 18 = \frac{16 \times d}{2/3}$

$\frac{12 \times 15 \times 2}{16 \times 3} = days$

9 = days

Work gets completed in = 9 + 6 = 15 days

S26. Ans.(d)

Sol .

ATQ,

$\frac{30}{15 - x} + \frac{30}{15 + x} = \frac{9}{2}$

$30\left(\frac{15 + x + 15 - x}{225 - x^2}\right) = \frac{9}{2}$

$\frac{200}{225 - x^2} = 1$

$x^2 = 25$

x = 5 km/hr

S27. Ans.(c)

Sol .

$a + b = 153$

$a \times b = 630 \times 9$

$(a - b)^2 = (a + b)^2 - 4ab$

$(a - b)^2 = (153)^2 - 4 \times 630 \times 9$

$(a - b)^2 = 23409 - 22680$

$(a - b)^2 = 729$

$a - b = 27$

S28. Ans.(a)

Sol .

$\frac{S_5}{5} = 24$

$S_5 = 120$

$S_4 = 120 - 8 = 112$

Sum of four members 8 years ago $= 112 - 4 \times 8$

$= 112 - 32$

$= 80$

Average at the time of the birth of youngest Member $= \frac{80}{4} = 20$ years

S29. Ans.(b)

Sol .

Profit % $= \frac{40}{960} \times 100$

$= \frac{400}{96}$

$= \frac{100}{24}$

$= \frac{25}{6}\%$

$= 4\left(\frac{1}{6}\right)\%$

S30. Ans.(c)

Sol .

Profits Ratio

$= 35000 \times 12 : 20000 \times 5 : 15000 \times 7$

$= 420 : 100 : 105$

$= 84 : 20 : 21$

B's profit $= 84125 \times \frac{20}{125}$

$= 673 \times 20$

$= 13460$