

Quantitative Aptitude Mega Quiz for RRB NTPC (Solutions)

S1. Ans.(d)

Sol.

$$x = \sqrt{1232 + 5y^2}$$

$5y^2 \rightarrow$ unit digit is either 5 or 0 for all values of y.

$$\Rightarrow 1232 + 0 = \text{unit digit} = 2$$

$$1232 + 5 = \text{unit digit} = 7$$

No number is a perfect square having unit digit 2 or 7.

S2. Ans.(a)

Sol.

put $x = 0, z = 1$, we get $y = -1$

$$\frac{3(-1)^2 + 0 + 1}{2 \times 1 - 0} = \frac{3+1}{2} = 2$$

S3. Ans.(a)

Sol.

$$\sin C - \sin D = 2 \cos \frac{C+D}{2} \sin \frac{C-D}{2}$$

S4. Ans.(c)

Sol.

$$x = 3 - \sqrt{7}$$

$$\frac{1}{x} = \frac{3+\sqrt{7}}{9-7}$$

$$\frac{1}{x} = \frac{3+\sqrt{7}}{2}$$

$$\frac{x^3}{8} + x^{-3}$$

$$\left(\frac{x}{2}\right)^3 + \left(\frac{1}{x}\right)^3 = \left(\frac{3-\sqrt{7}}{2}\right)^3 + \left(\frac{3+\sqrt{7}}{2}\right)^3$$

$$= \left[\left(\frac{3-\sqrt{7}}{2}\right) + \left(\frac{3+\sqrt{7}}{2}\right)\right] \left[\left(\frac{3-\sqrt{7}}{2}\right)^2 + \left(\frac{3+\sqrt{7}}{2}\right)^2 - \frac{9-7}{4}\right]$$

$$= (3) \left(\frac{9}{4} + \frac{7}{4} - \frac{6\sqrt{7}}{2} + \frac{9}{4} + \frac{7}{4} + \frac{6\sqrt{7}}{2} - \frac{1}{2}\right)$$

$$= (3) \left(8 - \frac{1}{2}\right) = \frac{45}{2} = 22\frac{1}{2}$$

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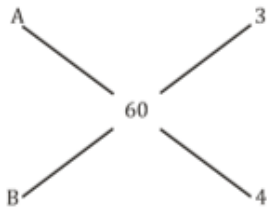
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S5. Ans.(b)

Sol.



work done in $5\frac{3}{7}$ days = $\left(5\frac{3}{7}\right) \times 7 = 38$ units

work percentage = $\frac{38}{60} \times 100 = \frac{190}{3} = 63\frac{1}{3}\%$

S6. Ans.(d)

Sol.

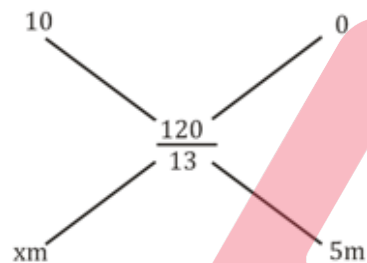
profit = 30%

$\Rightarrow 10 \rightarrow 13 \rightarrow \boxed{12}$

$10 = \frac{12}{13} \times 10$

ATQ

Using allegation



$$10 - \frac{120}{13} = 5m$$

$$\frac{10}{13} = 5m$$

$$m = \frac{2}{13}$$

$$\frac{120}{13} - 0 = xm$$

$$\frac{120}{13} = \frac{2}{13}m$$

$$m = 60\text{lt}$$

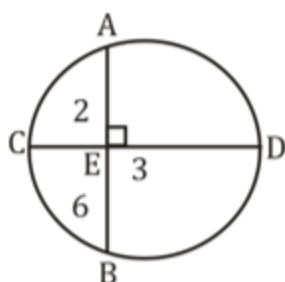
S7. Ans.(b)

Sol.

$$CE \times ED = AE \times EB$$

$$x \times 3 = 2 \times 6$$

$$x = 4$$



S8. Ans.(b)

Sol.

let every day expenses be = x

and days be y

$$xy = 360;$$

$$(x-3)(y+4) = 360$$

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

$$xy - 3y + 4x = xy + 12$$

$$4x - 3y = 12$$

$$xy = 360$$

$$x = \frac{360}{y}$$

$$4\left(\frac{360}{y}\right) - 3y = 12$$

$$\frac{480}{y} - y = 4$$

$$y = 20 \text{ days}$$

S9. Ans.(a)

Sol.

$$\angle BOC = 90 + \frac{144}{2} = 162^\circ$$

S10. Ans.(d)

Sol.

θ is in between $(90^\circ - 270^\circ)$

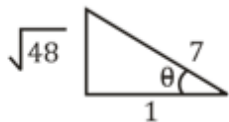
If θ is in between 90° to 180°

$\sin \theta$ is +ve

$\tan \theta$ is -ve

$$\sec \theta = -7 \Rightarrow \cos \theta = -\frac{1}{7}$$

$\Rightarrow$



$$P = \sqrt{48}$$

$$\sin \theta = \frac{\sqrt{48}}{7}$$

$$\tan \theta = -\sqrt{48}$$

$$\Rightarrow \sin \theta + \tan \theta = \frac{-6\sqrt{48}}{7}$$

if θ is in between $180^\circ - 270^\circ$

$\sin \theta = -ve$

$\tan \theta = +ve$

$$\Rightarrow \sin \theta = -\frac{\sqrt{48}}{7}$$

$$\tan \theta = \sqrt{48}$$

$$\sin \theta + \tan \theta = -\frac{\sqrt{48}}{7} + \sqrt{48} = \frac{6\sqrt{48}}{7}$$

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S11. Ans.(d)

Sol.

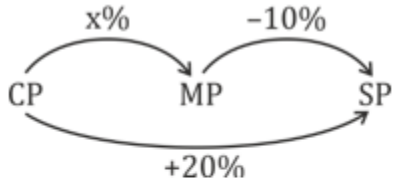
Income = Expenditure + Savings

$$\begin{array}{rcl} 100 & = & 70 + 30 \\ \downarrow 16\% & & \downarrow 10\% \\ 16 & = & 19 - 3 \end{array}$$

$$\therefore \text{Required percentage} = \frac{19}{70} \times 100 = 27.14$$

S12. Ans.(b)

Sol.



$$\frac{CP}{MP} = \frac{100 - D}{100 + P} = \frac{100 - 10}{100 + 20} = \frac{90}{120} = \frac{3}{4}$$

$$\therefore x\% = \frac{1}{3} \times 100 = 33.33\%$$

S13. Ans.(d)

Sol.

Let CP be Rs. 100

$$\therefore \text{Required price} = \frac{414}{69} \times 123 = \text{Rs. 738}$$

S14. Ans.(a)

Sol.

$$\begin{aligned} \text{Required Ratio} &= \frac{300+400+375+300+375}{350+500+425+375+350} \\ &= \frac{7}{8} \end{aligned}$$

S15. Ans.(d)

Sol.

Total no. of workers working in SSC Adda

$$= 350 + 500 + 425 + 375 + 350 = 2000$$

Total no. of workers = 5650

$$\text{Required Percentage} = \frac{2000}{5650} \times 100 = 35.39\%$$

S16. Ans.(a)

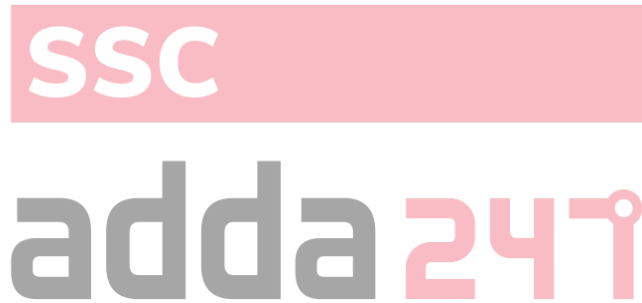
Sol.

Total number of workers in all three companies = 5650

Total no. of workers in department B = 1250

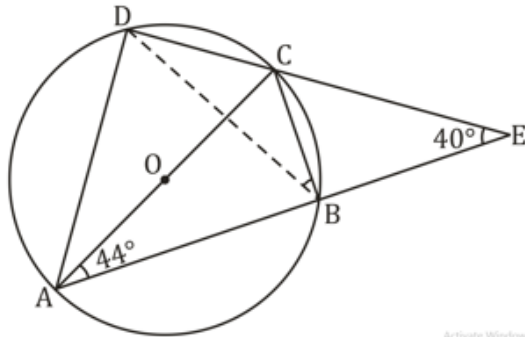
$\therefore$ Required central angle

$$= \frac{360^\circ}{5650} \times 1250 = 79.6^\circ$$



S17. Ans.(c)

Sol.



$$\angle ACD = 44^\circ + 40^\circ = 84^\circ \text{ (exterior angle of } \triangle ACE \text{)}$$

In $\triangle ACD$

$$\angle CAD = 90^\circ - \angle ACD = 90^\circ - 84^\circ = 6^\circ$$

$$\angle CAD = \angle CBD \text{ (made by same chord on the circumference of circle)}$$

$$\angle CBD = 6^\circ$$

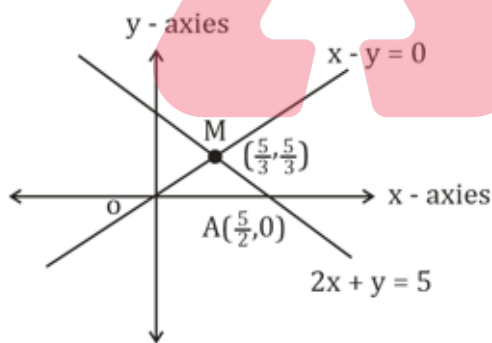
S18. Ans.(b)

Sol.

$$\begin{aligned} &= \frac{\sin\left(\frac{x}{2}\right)}{\cos\left(\frac{x}{2}\right)} \times 2 \sin \frac{x}{2} \cos \frac{x}{2} + 2 \cos^2 \frac{x}{2} - 1 \\ &= 2 \left(\sin^2 \frac{x}{2} + \cos^2 \frac{x}{2} \right) - 1 \\ &= 1 \end{aligned}$$

S19. Ans.(b)

Sol.



$$\begin{aligned} \text{Area of } \triangle OAM &= \frac{1}{2} \times \frac{5}{2} \times \frac{5}{3} \\ &= \frac{25}{12} = 2 \frac{1}{12} \end{aligned}$$

S20. Ans.(b)

Sol.

$$\begin{array}{r} 583 \overline{) 627} \overline{) 1} \\ \underline{583} \\ 44 \overline{) 583} \overline{) 13} \\ \underline{572} \\ 11 \overline{) 44} \overline{) 4} \\ \underline{44} \\ 0 \end{array}$$

$$\text{Req. sum} = 627 + 583 = 1210$$

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S21. Ans.(a)

Sol.

	Income	Expenditure	Saving
+25.5%	$\begin{pmatrix} 100 \\ 125.5 \end{pmatrix}$	$\begin{pmatrix} 90 \\ +25\% \\ 112.5 \end{pmatrix}$	$\begin{pmatrix} 10 \\ +30\% \\ 13 \end{pmatrix}$
		+	

S22. Ans.(a)

Sol.

$$\frac{ar(\triangle ABC)}{ar(\triangle PQR)} = \frac{9}{16}$$

$$\frac{AB}{PQ} = \frac{3}{4}$$

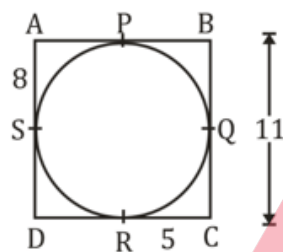
$$\therefore 3\text{unit} = 12$$

$$1\text{unit} = 4$$

$$\therefore PQ = 4 - 4 \times 4 = 16 \text{ cm.}$$

S23. Ans.(d)

Sol.



$$CR = QC = 5 \text{ cm}$$

$$\therefore BQ = 11 - 5 = 6 \text{ cm} = PB$$

$$AS = AP = 8 \text{ cm}$$

$$\therefore AB = AP + PB = 8 + 6 = 14 \text{ cm}$$

S24. Ans.(b)

Sol.

$$3 \cos^2 A + 6 \sin^2 A = 3$$

$$3 \cos^2 A + 6 - 6 \cos^2 A = 3$$

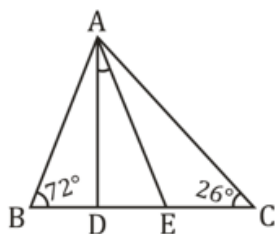
$$3 = 3 \cos^2 A$$

$$\cos^2 A = 1$$

$$A = 0^\circ$$

S25. Ans.(a)

Sol.



$$\angle DAE = \frac{1}{2} (\angle B - \angle C)$$

$$= \frac{1}{2} (72 - 26)$$

$$= \frac{1}{2} \times 46$$

$$= 23^\circ$$

S26. Ans.(c)

Sol.

$$\begin{aligned} & \frac{(\cos 9^\circ + \sin 81^\circ)(\sec 9^\circ + \operatorname{cosec} 81^\circ)}{\sin 56^\circ \sec 34^\circ + \cos 25^\circ \operatorname{cosec} 65^\circ} \\ &= \frac{2 \sin 81^\circ \times 2 \operatorname{cosec} 81^\circ}{\sin 56^\circ \operatorname{cosec} 56^\circ + \cos 25^\circ \sec 25^\circ} \\ &= \frac{4}{1+1} = 2 \end{aligned}$$

S27. Ans.(a)

Sol.

$$\begin{aligned} \text{Avg. of B, C and E} &= \frac{90+135+120}{3} \\ &= \frac{345}{3} = 115 \\ \therefore \text{Required\%} &= \frac{125-115}{125} \times 100 \\ &= \frac{10}{125} \times 100 \\ &= 8\% \end{aligned}$$

S28. Ans.(d)

Sol.

$$\begin{aligned} & \left(\frac{\sin \theta}{1+\cos \theta} + \frac{1+\cos \theta}{\sin \theta} \right) \left(\frac{1}{\tan \theta + \cot \theta} \right) \\ &= \frac{\sin^2 \theta + 1 + \cos^2 \theta + 2 \cos \theta}{\sin \theta (1+\cos \theta)} \times \sin \theta \cos \theta \\ &= \frac{2(1+\cos \theta)}{(1+\cos \theta)} \times \cos \theta \\ &= 2 \cos \theta \end{aligned}$$

S29. Ans.(d)

Sol.

$$\begin{aligned} 3 - 2 \sin^2 \theta - 3 \cos \theta &= 0 \\ 3 - 2 + 2 \cos^2 \theta - 3 \cos \theta &= 0 \\ 2 \cos^2 \theta - 3 \cos \theta + 1 &= 0 \\ 2 \cos^2 \theta - 2 \cos \theta - \cos \theta + 1 &= 0 \\ 2 \cos \theta (\cos \theta - 1) - 1 (\cos \theta - 1) &= 0 \\ (2 \cos \theta - 1) (\cos \theta - 1) &= 0 \\ \therefore 2 \cos \theta &= 1 \\ \cos \theta &= \frac{1}{2} \\ \theta &= 60^\circ \{ \because 0^\circ < \theta < 90^\circ \} \\ \therefore 2 \operatorname{cosec} \theta + \tan \theta &= 2 \operatorname{cosec} 60^\circ + \tan 60^\circ \\ &= \frac{4}{\sqrt{3}} + \sqrt{3} = \frac{4+3}{\sqrt{3}} = \frac{7}{\sqrt{3}} = \frac{7\sqrt{3}}{3} \end{aligned}$$

S30. Ans.(a)

Sol.

$$\begin{array}{ccc} \text{C.P} & & \text{S.P} \\ 4500 & \xrightarrow{+16\%} & 5220 \\ 5800 & \xrightarrow{-10\%} & 5220 \\ 10300 & & 10440 \\ \text{gain} & = & 140 \end{array}$$

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