

Quantitative Aptitude for RRB Group-D (Solutions)

S1. Ans.(b)

Sol.

$$40 \text{ CP} = 36 \text{ MP}$$

$$10\text{CP} = 9 \text{ MP}$$

$$\frac{\text{CP}}{\text{MP}} = \frac{90}{100} = 1\% \text{ discount} = 99$$

$$\text{Profit} = \frac{9}{90} \times 100 = 10\%$$

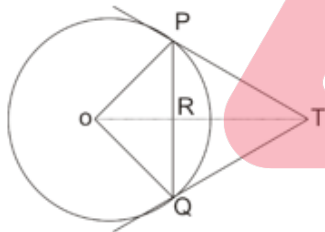
S2. Ans.(a)

Sol.

$$\text{PQ} = 8 \text{ cm}$$

$$\text{OP} = 5 \text{ cm}$$

$$\begin{aligned} \text{OR} &= \sqrt{25 - 16} \\ &= 3 \text{ cm} \end{aligned}$$



In $\triangle ORP$ & $\triangle OPT$

$$\angle POR = \text{common}$$

$$\angle PRO = \angle OPT = 90^\circ$$

$$\Rightarrow \triangle ORP \sim \triangle OPT$$

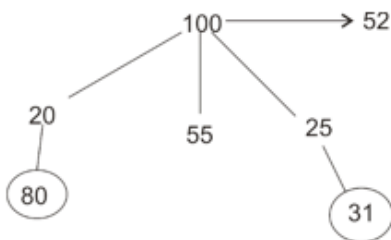
$$\frac{OR}{OP} = \frac{PR}{PT}$$

$$\frac{3}{5} = \frac{4}{PT}$$

$$PT = \frac{20}{3} \text{ cm}$$

S3. Ans.(c)

Sol.



TEST SERIES

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DFCCIL

JUNIOR EXECUTIVE

OPERATIONS & BD

30 Total Tests

$$\text{Total} = 5200$$

$$\text{Brightest} = 80 \times 20 = 1600$$

$$\text{Dullest} = 25 \times 31 = 775$$

$$\text{Remaining} = 5200 - (1600 + 775) = 2825$$

$$\text{Average} = \frac{2825}{55} = 51.4$$

S4. Ans.(c)

Sol.

Let the wickets = x

$$\Rightarrow \text{total run till last match} = 24.85x$$

ATQ,

$$24.85x + 52 = 24(x + 5)$$

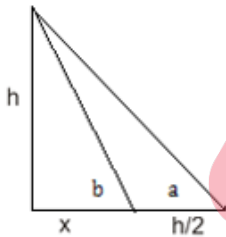
$$0.85x = 68$$

$$x = \frac{400}{5} = 80$$

S5. Ans.(a)

Sol.

cot a - cot b



$$= \frac{x + h/2}{h} - \frac{x}{h}$$

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

S6. Ans.(a)

$$\text{Sol. LCM of } (200, 300, 360, 450) = 1800$$

S7. Ans.(c)

Sol.

$$\text{Volume taken out} = 10 \times 7.5 \times 6$$

$$\text{Spread over; surface area} =$$

$$= 125 \times 15 - 10 \times 7.5$$

$$\text{Height} = h$$

$$(125 \times 15 - 75)h = 10 \times 7.5 \times 6$$

$$24h = 6 \text{ m}$$

$$h = 25 \text{ cm}$$

S8. Ans.(b)

Sol.

$$\frac{\sin^2\theta + 1 + \cos^2\theta + 2\cos\theta}{\sin\theta(1 + \cos\theta)}$$
$$\frac{2}{\sin\theta}$$

S9. Ans.(b)

Sol.

$$\frac{x+12}{6} = 112$$

$$X+12 = 672$$

$$X = 660$$

$$\text{Correct answer} = \frac{660}{6} + 12 = 122$$

S10. Ans.(a)

Sol.

$$81000 = 3^4 \times 2^3 \times 5^3$$

1- 5 And 1- 2 is compulsory

$$\Rightarrow 5 \times 3 \times 3 = 45$$

S11. Ans.(d)

Sol.

let no. of people = n

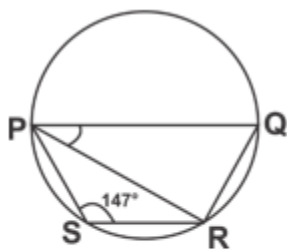
$$np = 13q + (n - 13)r$$

$$np - nr = 13(q - r)$$

$$n = \frac{13(q - r)}{p - r}$$

S12. Ans.(b)

Sol.



$$\angle PQR = 180^\circ - \angle PSR = 180^\circ - 147^\circ$$
$$= 33^\circ$$

$$\angle PRQ = 90^\circ \text{ (Angle on semicircle)}$$

$$\angle QPR = 90^\circ - 33^\circ$$
$$= 57^\circ$$

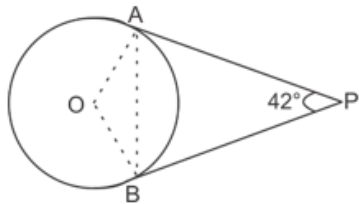
S13. Ans.(b)

Sol.

$$\begin{aligned}\angle AOB &= 180^\circ - \angle APB \\ &= 180^\circ - 42^\circ \\ &= 138^\circ\end{aligned}$$

in ΔAOB , $OA = OB$ (Radius)

$$\begin{aligned}\angle OAB &= \frac{1}{2}(180^\circ - 138^\circ) \\ &= 21^\circ\end{aligned}$$



S14. Ans.(a)

Sol.

$$\begin{aligned}x^2 + x^{-2} &= (x + x^{-1})^2 - 2 \\ &= 169 - 2 = 167\end{aligned}$$

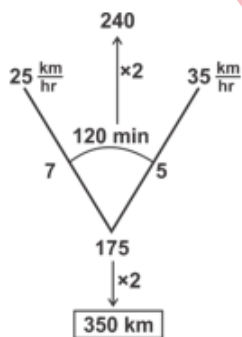
S15. Ans.(d)

Sol.

$$\begin{aligned}a^3 - b^3 &= (a - b)(a^2 + b^2 + ab) \\ \Rightarrow \frac{1.50}{100} &= 0.015\end{aligned}$$

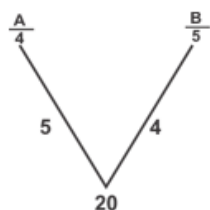
S16. Ans.(c)

Sol.



S17. Ans.(b)

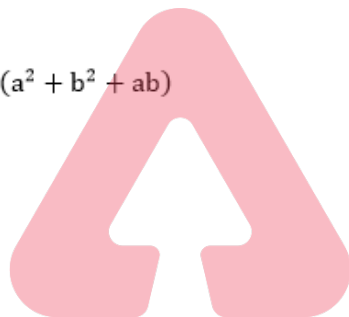
Sol.



A is opened for 3 hours = 15 unit

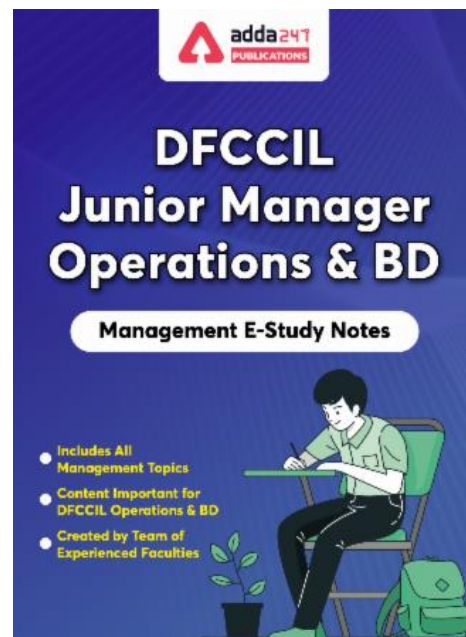
Remaining part = $\frac{5}{4} = 1\frac{1}{4}$ hours

By B



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S18. Ans.(d)

Sol.

$$\tan \theta + \frac{1}{\tan \theta} = \pi$$

$$\tan^2 \theta + \frac{1}{\tan^2 \theta} = \pi^2 - 2$$

$$\sec^2 \theta + \operatorname{cosec}^2 \theta = 2 + \pi^2 - 2 = \pi^2$$

S19. Ans.(c)

Sol.

$$\frac{4}{3}\pi R^3 = n \times \frac{4}{3}\pi r^3$$

$$n = \frac{1331}{27} = 49$$

S20. Ans.(b)

Sol.

$$\frac{\frac{1}{4} \times \frac{1}{2} + 2 \times \frac{1}{3} - 4}{3 + 16 - 96} = \frac{\frac{1}{8} + \frac{2}{3} - 4}{-77} = \frac{-77}{24}$$

S21. Ans.(d)

Sol.

$$(8)^{1/2}, (13)^{1/4}, (16)^{1/5}, (41)^{1/10}$$

L.C.M of 2, 4, 5, 10 $\rightarrow 20$

$$(8)^{1/2} \Rightarrow (8)^{10/20}$$

$$(13)^{1/4} \Rightarrow (13)^{5/20}$$

$$(16)^{1/5} \Rightarrow (16)^{4/20}$$

$$(41)^{1/10} \Rightarrow (41)^{2/20}$$

$$8^{10} > 13^5, 16^4, 41^2$$

$\therefore \sqrt{8}$ is the greatest number

S22. Ans.(a)

Sol.

$$2^x = 3^y = 6^{-z} = k$$

$$2 = k^{1/x}$$

$$3 = k^{1/y}$$

$$6 = k^{-1/z}$$

$$2 \times 3 = 6$$

$$k^{1/x} \times k^{1/y} = k^{-1/z}$$

$$k^{\frac{1}{x} + \frac{1}{y}} = k^{-1/z}$$

$$\frac{1}{x} + \frac{1}{y} = \frac{-1}{z}$$

$$\frac{1}{x} + \frac{1}{y} + \frac{1}{z} = 0$$

S23. Ans.(b)

Sol.

$$\begin{aligned} & 2\sqrt[3]{40} - 4\sqrt[3]{320} + 3\sqrt[3]{625} - 3\sqrt[3]{5} \\ \Rightarrow & 2\sqrt[3]{8 \times 5} - 4\sqrt[3]{64 \times 5} + 3\sqrt[3]{125 \times 5} - 3\sqrt[3]{5} \\ = & 2 \times 2\sqrt[3]{5} - 4 \times 4\sqrt[3]{5} + 3 \times 5\sqrt[3]{5} - 3\sqrt[3]{5} \\ = & 4\sqrt[3]{5} - 16\sqrt[3]{5} + 15\sqrt[3]{5} - 3\sqrt[3]{5} \\ = & 3\sqrt[3]{5} - 3\sqrt[3]{5} \\ = & 0 \end{aligned}$$

S24. Ans.(c)

Sol.

$$\begin{aligned} & \sqrt{40 + \sqrt{9 \times 81}} \\ = & \sqrt{40 + \sqrt{9 \times 9}} \\ = & \sqrt{40 + 9} \\ = & 7 \end{aligned}$$

S25. Ans.(b)

Sol.

$$\begin{aligned} & \frac{(x - \sqrt{24})(\sqrt{75} + \sqrt{50})}{\sqrt{75} - \sqrt{50}} = 1 \\ (x - \sqrt{24}) &= \frac{\sqrt{75} - \sqrt{50}}{\sqrt{75} + \sqrt{50}} \\ x - \sqrt{24} &= \frac{(\sqrt{75} - \sqrt{50})^2}{75 - 50} \\ x - \sqrt{24} &= \frac{75 + 50 - 2\sqrt{75 \times 50}}{25} \\ x - \sqrt{24} &= \frac{75 + 50 - 2 \times 25\sqrt{6}}{25} \\ x - \sqrt{24} &= 5 - 2\sqrt{6} \\ x - 2\sqrt{6} &= 5 - 2\sqrt{6} \\ x &= 5 \end{aligned}$$

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S26. Ans.(c)

Sol.

$$\begin{aligned} & \sqrt{20} + \sqrt{12} + \sqrt[3]{729} - \frac{4}{\sqrt{5} - \sqrt{3}} - \sqrt{81} \\ = & 2\sqrt{5} + 2\sqrt{3} + 9 - \frac{4(\sqrt{5} + \sqrt{3})}{5 - 3} - 9 \\ = & 2\sqrt{5} + 2\sqrt{3} + 9 - 2\sqrt{5} - 2\sqrt{3} - 9 \\ = & 0 \end{aligned}$$

S27. Ans.(a)

Sol.

$$\begin{aligned} a\sqrt{2} + b\sqrt{3} &= \sqrt{98} + \sqrt{108} - \sqrt{48} - \sqrt{72} \\ a\sqrt{2} + b\sqrt{3} &= 7\sqrt{2} + 6\sqrt{3} - 4\sqrt{3} - 6\sqrt{2} \\ a\sqrt{2} + b\sqrt{3} &= \sqrt{2} + 2\sqrt{3} \\ a &= 1 \\ b &= 2 \end{aligned}$$

S28. Ans.(a)

Sol.

$$\sqrt[3]{a} = \sqrt[3]{26} + \sqrt[3]{7} + \sqrt[3]{63}$$

Taking near cubes to 26, 7 & 63

$$\sqrt[3]{a} < \sqrt[3]{27} + \sqrt[3]{8} + \sqrt[3]{64}$$

$$\sqrt[3]{a} < 3 + 2 + 4$$

$$\sqrt[3]{a} < 9$$

$$a < 729$$

$$\& a > 216$$

S29. Ans.(d)

Sol.

$$\begin{aligned} & 2 + \frac{6}{\sqrt{3}} + \frac{1}{2 + \sqrt{3}} + \frac{1}{\sqrt{3} - 2} \\ \Rightarrow & 2 + \frac{2 \times 3}{\sqrt{3}} + \frac{2 - \sqrt{3}}{4 - 3} - \frac{(2 + \sqrt{3})}{4 - 3} \\ \Rightarrow & 2 + 2\sqrt{3} + 2 - \sqrt{3} - 2 - \sqrt{3} \\ = & 2 \end{aligned}$$

S30. Ans.(c)

Sol.

$$\text{Let } x = \sqrt{30 + \sqrt{30 + \sqrt{30 + \dots}}}$$

$$x = \sqrt{30 + x}$$

$$x^2 = 30 + x$$

$$x^2 - x - 30 = 0$$

$$x^2 - 6x + 5x - 30 = 0$$

$$x(x - 6) + 5(x - 6) = 0$$

$$(x + 5)(x - 6) = 0$$

$$x = 6, -5$$

$$x = 6$$



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Special Offer

**RRC 2021
GROUP D**

40 TOTAL TESTS

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