RRB CLERK MAINS MEMORY BASED PAPER (QUANTITATIVE APTITUDE) SOLUTIONS

S1. Ans. (b)
Sol. Let initial quantity = 5x

\[
\begin{align*}
\text{Milk} & \quad \text{Water} \\
4x & \quad x \quad 3x \\
\text{New ratio} & \quad 1.25x \\
\text{New quantity} & \quad \frac{3}{2} \\
x & \quad 24 \text{l} \\
\text{initial quantity of milk} & \quad 4x = 96 \text{l}
\end{align*}
\]

S2. Ans. (b)
Sol. Ratio of profit 2 : 3 : 5 \times \frac{2}{3} : 7 \times \frac{2}{3} = 6 : 9 : 10 : 14

Share of B = \frac{18}{20} \times 12000 = 10800 Rs

S3. Ans. (a)
Sol. Let initially length = l, Breadth = b

\[
\begin{align*}
\text{Area} & = lb \\
\text{New area} & = 1.5 l \times 0.9b = 1.35 lb \\
\% \text{age increase} & = 35\%
\end{align*}
\]

S4. Ans. (b)
Sol. Let Principal = Rs 100

\[
\begin{align*}
\text{Profit} & = \frac{6000 \times x \times 6}{100} = \frac{6000 \times (x + 2) \times 4}{100} = 720 \\
x & = 10\%
\end{align*}
\]

S5. Ans. (b)
Sol. Total cost price = (150 \times 250) + 2500

\[
= 37500 + 2500 = 40000
\]

Total selling price = 320 \times \frac{100-5}{100} \times 150 = 45600

\[
\text{profit percentage} = \frac{45600-40000}{40000} \times 100 = 14\%
\]

S6. Ans. (e);
Sol. A + B + C = 84 \times 3 = 252

A + B + C + D = 80 \times 4 = 320

Age of D = 320 – 252 = 68

Age of E = 71

B + C + D + E = 316

B + C = 316 – (68 + 71)

B + C = 177

Age of A = 252 – 177 = 75 years

S7. Ans. (c)
Sol. C.P. to the retailer = 1955 \times \frac{100}{115} = 1700

But it is at a discount of 15%, M.P. = 1700 \times \frac{100}{85} = 2000

Total discount = 2000 – 1700 = Rs. 300
S8. Ans.(b)
Sol. Initially low quality wheat = 10% of 150 = 15kg
   High quality wheat = 150 - 15 = 135kg
   15kg of low quality wheat will be 5% of the final quantity of wheat
   Final quantity of wheat = \( \frac{100}{5} \times 15 = 300 \) kg
   Quantity of high quality wheat = 300 - 15 = 285kg
   High quality wheat added = 285 + 135 = 150kg

S9. Ans.(e)
Sol. Required probability = \( (^6C_3 + ^4C_3) \div (^{12}C_3) = \frac{6}{55} \)

S10. Ans.(a)
Sol. per hour consumption of 1st candle = \( \frac{1}{5} \)
    per hour consumption of 1st candle = \( \frac{1}{4} \)
   Let after x hour their height is in ratio = 3 : 2
   then, \( \frac{1 - \left( \frac{x}{5} \right)}{1 - \left( \frac{x}{4} \right)} = \frac{3}{2} \)
   Solving the equation, \( x = \frac{20}{7} \)

S11 Ans.(c)
Sol. Required ratio = \( \frac{760}{640} = \frac{8}{7} \)

S12. Ans.(a)
Sol. Total no. of females in company Y = 450 + 360 + 280 + 280 = 1370

S13. Ans.(c)
Sol. No. of males in Delhi and Chennai = 360 + 320 = 680
   No. of females in Chandigarh and Kolkata together = 210 + 280 = 490
   Required percentage = \( \frac{680}{490} \times 100 \approx 139\% \)

S14. Ans.(b)
Sol. Required percentage = \( \frac{1460}{2830} \times 100 \approx 52\% \)

S15. Ans.(d)
Sol. Except Kolkata, in all cities the no. of females in company Y are more than the no. of females in company X

S16. Ans.(b)
Sol. Tax = \( \frac{30}{100} \times 5 \) crore
   = 1.5 crores
   Penalty = \( \frac{30}{100} \times 1.5 \) crore
   = 0.45 crore
   Total Tax = 1.5 + 0.45
   = 1.95 crore
   \( \therefore \) Required money = (5 - 1.95) = 3.05 crores.

S17. Ans.(b)
Sol. Money that he will get = \( 3,25,000 - \frac{10}{100} \times 3,25,000 - \frac{55}{100} \times \left( \frac{10}{100} \times 3,25,000 \right) \)
   = 2,74,625 Rs.
   \( \therefore \) Required no. of day = \( \frac{274625}{65000} \)
   = 4.225 \approx 5th day
S18. Ans.(e)
Sol. Required Ratio = \[\frac{30,0000}{60,000}\] 
\[= \frac{5}{1}\]

S19. Ans.(a)
Sol. Tax = \[\frac{30}{100} \times 20 \text{ crore}\] 
\[= 6 \text{ crore}\]
Penalty = \[\frac{25}{100} \times 6 \text{ crore} = 3.3 \text{ crore}\] 
\[\therefore \text{ Total tax} \rightarrow 9.3 \text{ crores}\]
\[\therefore \text{ Required amount} = \frac{25}{100} \times 9.3 \text{ crores}\] 
\[= 2.325 \text{ crores}\] 
\[= 2,325,00,000\]

S20. Ans.(d)
Sol. Required days = \[\frac{5200000}{6500} - \frac{500000}{10000}\] 
\[= 80 - 50 = 30 \text{ days}\]

S21. Ans.(c)
Sol. Share of C = \[\frac{(15000\times16)}{(12000\times24)+(16000\times24)+(15000\times16)}\] 
\[= 12000\text{Rs}\]

S22. Ans.(b)
Sol. Let the price before increase = \(x\)
Then new price = \(\frac{100+20}{100} \times x = 1.2x\)
\[\frac{115}{100} \times (x \times 24) = 1.2x \times y \ (y = \text{ new consumption quantity})\]
y = 23 kg

S23. Ans.(e)
Sol. Average speed = \[\frac{\text{Total distance covered}}{\text{Total time taken}}\] 
\[= \frac{54}{11} \frac{\text{km}}{\text{h}}\]

S24. Ans.(a)
Sol. Let CP = Rs 1000
SP at 10% loss = \(\frac{100-90}{100} \times 1000 = 900 \text{ Rs}\)
But actual CP = \(1000 \times \frac{100-20}{100} = 800 \text{ Rs}\)
Profit percentage = \(\frac{900-800}{800} \times 100 = 12.5\%\)

S25. Ans.(d)
Sol. Let pipe B be turned off after \(x\) minutes
\[\therefore \text{part filled by (A + B) in } x \text{ min.} + \text{part filled by A in } (20 - x) \text{min.} = 1\]
or, \(\frac{1}{30} + \frac{1}{45} \times (20 - x) \frac{1}{30} = 1\]
or, \(\frac{5x}{90} - \frac{x}{30} = 10\)
or, \(\frac{5x}{30} = 10\)
or, \(x = 15 \text{ minutes}\).

S26. Ans.(a)
Sol. Let the duration be \(x\) hours.
ATQ, \[\frac{600}{x} + \frac{600}{x+2} = 200\]
or, \[\frac{600}{x} - \frac{1200}{2x+1} = 200 \approx 2x^2 + x - 3 = 0\]
It gives \(x = 1 \text{ hour}\).

S27. Ans.(c)
Sol. Let the sum of their present ages = \(x\) years.
After replacing, sum of their ages = \( x - (4 \times 3) = x - 12 \) years
Thus, required difference in age of two members = 12 years.

S28. Ans.(d)
Sol. Let the added money be \( x \).
Then, \( \left( \frac{830+x}{100} \right) \times 14 \times 3 - \frac{830 \times 12 \times 3}{100} = 93.90 \)
or, \( 34860 + 42x - 29880 = 9390 \)
or, \( x = \text{Rs. 105.} \)

S29. Ans.(c)
Sol. ATQ \( 456976 = 390625 \left( 1 + \frac{4}{100} \right)^n \)
or, \( \left( 1 + \frac{4}{100} \right)^n = \frac{456976}{390625} = \left( \frac{26}{25} \right)^4 \)
or, \( n = 4 \) years.

S30. Ans.(a)
Sol. Area = \( 2x^2 \text{ m}^2 \)

S31. Ans.(e)
Sol. I. \( \rightarrow l = \frac{132}{44} \times 7 = 21 \) cm
II. \( \rightarrow 2l + \left( \frac{5}{24} \right) \times 2 = P \)
P = \( \frac{12}{7} \times 21 = 72 \) cm
\( b = 36 - 21 = 15 \) cm
area = \( 21 \times 15 = 315 \text{ cm}^2 \)
So both I & II are necessary.

S32. Ans.(b)
Sol. I. \( \rightarrow x = 3, 4 \)
II. \( \rightarrow x = 3, y = 6 \) or \( y = 3, x = 6 \)
x\(^2 + y\(^2 = 45 \)
Statement II alone is sufficient.

S33. Ans.(b)
Sol. Let length of I\(^{th}\) train = \( L_1 \)
Length of II\(^{th}\) train = \( L_2 \)
1. \( \rightarrow \frac{L_1}{2x} = 9 \)
2. \( \rightarrow \frac{L_1 + L_2}{3x+2x} = 45 \)
\( L_1 + L_2 \)
\( 5x \)
But when running in same direction relative speed will be
\( 3x - 2x = x \)
\( L_1 + L_2 = 45 \times 5 = 225 \) seconds
So Statement II alone is sufficient.
S34. Ans. (d)
Sol. 1. → Discount = 15%  
SP – CP = $16\text{ Rs}$  
2. → $\text{MP} – \text{SP} = \frac{15}{100} \times 16 = 24\text{ Rs}$  
So even using both statements, we can’t find the marked price of the article.

S35. Ans. (c)
Sol. Let there are $x$ no. of columns.  
St. I \: \text{0.625x \times x = 40, x$^2$ = 64}  
$x = 8$, no. of rows = 5  
student in each column = 5  
St. II \: \text{$\frac{5}{8}x \times x = 40, x$^2 = 64, x = 8}$  
no. of rows = 5  
So either I or II is sufficient to answer the question.

S36. Ans. (c)
Sol. $2x^2 – 12x – 9x + 54 = 0$  
$2x(x - 6) - 9(x - 6) = 0$  
x = $\frac{6}{2}$  
y = $7, 7$  
x < y

S37. Ans. (b)
Sol. $x^2 - 14x - 5x + 70 = 0$  
x(x - 14) - 5(x - 14) = 0  
x = $5, 14$  
$2y^2 - 10y - 7y + 35 = 0$  
$2y(y - 5) - 7(y - 5) = 0$  
y = $\frac{5}{2}$  
x ≥ y

S38. Ans. (d)
Sol. $3x^2 + 8x - 3x - 8 = 0$  
x(3x + 8) - 1(3x + 8) = 0  
x = $1, \frac{8}{3}$  
y = $3y - y + 3 = 0$  
y(y - 1) - 3(y - 1) = 0  
y = 1, 3  
x ≤ y

S39. Ans. (d)
Sol. $12x^2 - 6x - 10x + 5 = 0$  
$6x(2x - 1) - 5(2x - 1) = 0$  
x = $\frac{1}{2}, \frac{5}{6}$  
$18y^2 - 30y - 15y + 25 = 0$  
$6y(3y - 5) - 5(3y - 5) = 0$  
y = $\frac{5}{3}, \frac{5}{6}$  
x ≤ y

S40. Ans. (a)
Sol. $3x^2 - 3x - 8x + 8 = 0$  
$3x(x - 1) - 8(x - 1) = 0$  
x = $1, \frac{8}{3}$  
$3y^2 + 12y + 8y + 32 = 0$  
$3y(y + 4) + 8(y + 4) = 0$  
y = $-4, -2\ x > y$