SBI PO (Quantitative Aptitude) memory based held on 04/06/17
Solution

S46. Ans.(b)
Sol.
For quantity I →
First the different no. of ways to arrange 5 men or 5 women = 5!
Now,
_M_M_M_M_M_
No. of ways of arranging 5 men and 5 women such that no two women or men sit together = $2 \times 5! \times 5!$
For quantity II →
No. of ways of arranging 5 men and 5 women such that all men sit together → $6! \times 5!$
∵ $2 \times 5! \times 5! < 6! \times 5!$
Then Quantity I < Quantity II

S47. Ans.(b)
Sol.
Since S is an acute angle
∴ $(a + 40) + a < 90$
$(2a + 40) < 90$
$2a < 50$
$a < 25°$
∴ Quantity I < Quantity II

S48. Ans.(a)
Sol.
For Quantity I →
Let required no = 10x+ y
∵ $10y + x = 10x + y + 36$
$9y - 9x = 36$
$y - x = 4$
∴ unit digit of the no. should be 4 more than the ten's digit of the number.
∴ such possible numbers from 1 to 63 are
$= 04, 15, 26, 37, 48, 59$

∴ Required probabity $= \dfrac{6}{63}$

For quantity II →
Possible numbers from 1 to 63 = 8, 24, 40, 56

Required probability $= \dfrac{4}{63}$

∴ Quantity I > Quantity II

S49. Ans.(b)
Sol.
From A → m + n = 10 × k (Let k is an integer value)
From B → 10m + 7n = 70 × l (let l is an integer value)
From C → n > m
From A and B

$$\begin{aligned} 10m + 10n &= 100k \\ 10m + 7n &= 70l \\ \hline 10n - 7n &= 100k - 70l \\ 3n &= 100k - 70l \end{aligned}$$

3n=10(10k-7l); Hence n is divisible by 10. Thus option A and B together are needed to solve the question.

S50. Ans.(b)
Sol.
Let speed of boat in still water on Thursday = x
$$\dfrac{12 \times 18}{x - 1} = \dfrac{16 \times 15}{16 + 2}$$
$$= \dfrac{12 \times 18 \times 18}{16 \times 15} = x - 1$$
$x - 1 = 16.2$
$x = 17.2$ kmph

S51. Ans.(c)
Sol.
Let speed of boat in still water on Monday = x
$$\dfrac{15 \times 18}{x - 2} = \dfrac{45}{11} + \dfrac{16 \times 15}{x + 2}$$
$$15 \left(\dfrac{18}{x - 2} - \dfrac{16}{x + 2} \right) = \dfrac{45}{11}$$
$$\dfrac{18}{x - 2} - \dfrac{16}{x + 2} = \dfrac{3}{11}$$
If we put x= 20
Then it satisfy the above equation
∴ x = 20 kmph

S52. Ans.(d)
Sol.
Speed of boat in still water on Tuesday = 15 km/hr
$66\frac{2}{3}\% = \frac{2}{3}$
Speed of boat in still water on Wednesday $= 15 + \frac{2}{3} \times 15$
$= 25$ km/hr
$\frac{14 \times 18}{25 - x} = \frac{14 \times 15}{(15 + 3)} \times \frac{9}{10}$
$\frac{6}{25 - x} = \frac{5}{18} \times \frac{9}{10}$
$\frac{6}{0.25} = 25 - x$
$25 - x = 24$
$x = 1$ km/hr

S53. Ans.(a)
Sol. Given
Speed of boat in still water on Saturday = 21 km/h
$28\frac{4}{7}\% = \frac{2}{7}$
∴ Speed of boat in still water on Sunday $= 21 - \frac{2}{7} \times 21$
$= 21 - 6 = 15$ kmph
$\frac{10 \times 18}{21 - x} = \frac{19}{16} \times \frac{10 \times 15}{15 + 4}$
x= 1.8
Required time $= \frac{57.6}{21 - 1.8}$
$= \frac{57.6}{19.2} = 3$hrs

S54. Ans.(a)
Sol.
$\frac{18 \times 18}{x - 4} = 2 + \frac{12 \times 15}{17 + 1}$
$18 \times 18 = 12\,(x - 4)$
$x - 4 = 27$
$x = 31$ kmph
Required upstream speed $= 31 - 4 = 27$ kmph

Solutions (55-57)
For Bag A –
No. of yellow balls = 18
No. of green balls = 18 + 4 = 22
According to the question
Total no. of balls in bag A are in multiple of 13.
so by hit and trial method.
If we assume total no. of balls in bag A = 65
Then, No. of black balls = 25
It satisfies the probability Statement given in the question.

By similar method for Bag B —
No. of Yellow balls = 22
No. of Green balls = 25

No. of Black balls = 28

For Bag C →
No. of Yellow balls = 42
No. of Green balls = 21
No. of Black balls = 15

S55. Ans.(d)
Sol.
After replacement →
Yellow no of balls in beg B = 22 – x
Black no. of balls in beg B = 28+ 5 = 33
Green no. of balls in bag B = 25
Then, $\frac{33}{22 - x + 33 + 25} = \frac{11}{26}$
$\frac{33}{80 - x} = \frac{11}{26}$
$78 = 80 - x$
$x = 2$

S56. Ans.(e)
Sol.
Required probability $= \frac{18}{65} \times \frac{22}{75} + \frac{22}{65} \times \frac{25}{75} + \frac{25}{65} \times \frac{28}{75}$
$= \frac{1646}{65 \times 75}$

S57. Ans.(c)
Sol.
Required % $= \frac{40 - 1}{40} \times 100$
$= \frac{39}{40} \times 100$
$= 97.5\%$

S58. Ans.(c)
Sol.
Let MP of item-II by seller A = $100x$
∴ MP of item-II by seller C = $100x$
$\frac{\frac{100}{100 + s} \times 68x}{\frac{100}{100 + 2s - 4} \times 84x} = \frac{17}{21}$
$\frac{68}{84} \times \frac{96 + 2s}{100 + s} = \frac{17}{21}$
$\frac{96 + 2s}{100 + s} = \frac{1}{1}$
$96 + 2s = 100 + s$
$s = 4$

S59. Ans.(b)
Sol.
Let mark price of item II = $100x$
Let mark price of item III = $100y$
∴ $100x + 100y = 6000$
$x + y = 60$ ....(i)
And, $72x - 84y = 420$
$6x - 7y = 35$ ....(ii)

From (i) and (ii)
$y = 25$
$x = 35$
∴ M.P of item II = 3500
M.P. of item III = 2500
Required % = $\dfrac{3500 - 2500}{2500} \times 100$
$= \dfrac{1000}{25}$
$= 40\%$

S60. Ans.(a)
Sol.
Let M.P. of item II = $100a$
∴ S.P. of item II by seller A = $68a$
S.P. of item II by seller B = $(100 - x)a$

Then $(168 - x)a = (3888) \times 2$
$(184 - x)a = 4320 \times 2$
∴ $\dfrac{168 - x}{184 - x} = \dfrac{9}{10}$
$(10 \times 168) - 10x = 9 \times 184 - 9x$
$x = 24$
$a = 54$
Now S.P. of item II by seller C = 4536 Rs.

S61. Ans.(e)
Sol.
Let S.P. of item I = 500
∴ S.P. of item III = 600
C. P. of item I $= \dfrac{100}{125} \times 500 = 400$
C. P. of item II $= \dfrac{100}{120} \times 600 = 500$
Profit on item I = 500 – 400 = 100

∴ $100 \to 750$
$1 \to 7.5$
$(200) \to (200 \times 7.5) = 1500$ Rs.

S62. Ans.(a)
Sol.
C.P. = 60 Rs.
M. P. $= \dfrac{200}{300} \times 60 + 60$
$= 40 + 60$
$= 100$
Total C.P. = $60 \times 5 = 300$ Rs.
Total selling price should be = 380 Rs.
S.P. of item III by seller E = (380 – 64 – 67 – 86 – 84) = 79
∴ Minimum required discount = (100 – 79) = 21%

S63. Ans.(b)
Sol.
From question we observe that sum of investment of A and C is equal to B for first quarter.

So, if ratio of investment of B is equal to (A + C) for all quarters of year then B's profit is 50% of total profit.
So profit of B $= \dfrac{125000}{2}$
$= 62500$

S64. Ans.(b)
Sol.
Total amount invested by A + B in a year
$\Rightarrow 2500 + 7x + 7y + 13z = 9000$ ....(i)
Total amount invested by B and C in a year
$\Rightarrow 2300 + 8x + 7y + 13z = 10500$ ....(ii)
From (i) and (ii)
$200 - x = -1500$
$x = 1700$
Total amount for second quarter = 17000

S65. Ans.(d)
Sol.

P •——————————————→• Q
A ——→   ←—— B
54 kmph   66 kmph

In $\dfrac{1}{2}$h train A will cover = 27 km

Distance between P and Q $(x) = 27 + \dfrac{13}{3} \times 120$
$= 27 + 520$
$= 547 \, km$
Total time taken in given condition $= \left(\dfrac{1}{2} + \dfrac{13}{3}\right)h = \dfrac{29}{6}$ h
New time taken according to condition $= \dfrac{547 + 2 \times 54}{(66 - 54)}$
$= \dfrac{655}{12}$ h
Required difference in time $= \dfrac{655}{12} - \dfrac{29}{6} = \dfrac{597}{12}$
= 49 hour 45 min.

S66. Ans.(c)
Sol.

Required ratio $= \dfrac{66 - 54}{66 + 54} = 1 : 10$

$\Rightarrow x = 33\dfrac{1}{3}$

S67. Ans.(a)
Sol.
Area of quadrilateral BFDE = Area of rectangle ABCD –
Area of ΔABE – Area of ΔDCF
$$= 120 - 30 - 25$$
$$= 65$$

S68. Ans.(a)
Sol.
Ratio of Investment of A, B and C
$(3000 \times 4 + 1800 \times 5 + 3600 \times 3)$
$\qquad\qquad : (4000 \times 4 + 8000 \times 5)$
$\qquad\qquad : (14000 + 33600)$
$31800 : 56000 : 47600$
$159 : 280 : 238$
Profit of C $= \dfrac{238}{677} \times 6770000$
$= 238000$
Average of profit earned by $(A + B + C) \approx 225666$

S70. Ans.(a)
Sol.
Let E do work in $4x$ days
Let F do work in $5x$ days
$\dfrac{24}{5x} + \dfrac{24}{4x} + \dfrac{20}{\frac{100}{3}} + \dfrac{20}{\frac{200}{3}} = 1$
$24\left(\dfrac{9}{20x}\right) + \dfrac{60}{100} + \dfrac{60}{200} = 1$
$\dfrac{24 \times 9}{20x} = 1 - \dfrac{180}{200}$
$\dfrac{24 \times 9}{20x} = \dfrac{1}{10}$
$x = 108$
Together E and F can do work in $= \dfrac{4 \times 108 \times 5 \times 108}{9 \times 108}$
$\qquad\qquad = 240$ days
Required difference $= \dfrac{240}{4 \times 108} - \dfrac{240}{5 \times 108}$
$= \dfrac{240}{108}\left(\dfrac{1}{20}\right) = \dfrac{1}{9}$

S71. Ans.(e)
Sol.

As per given condition
$\dfrac{5}{10} + \dfrac{5}{15} + \dfrac{x}{12} + \dfrac{x}{18} = \left(1 - \dfrac{1}{36}\right)$
$\dfrac{5x}{36} = \dfrac{35}{36} - \dfrac{5}{6}$
$x = \dfrac{36}{5}\left(\dfrac{35 - 30}{36}\right)$
$= 1$ days.

S72. Ans.(d)
Sol.
Part of work completed by E $= \dfrac{5}{20} = \dfrac{1}{4}$
3 day work by $(A + B + D) = \dfrac{1}{10} + \dfrac{1}{12} + \dfrac{1}{18}$
$= \dfrac{18+15+10}{180} = \dfrac{43}{180}$
9 day work $= (3A + 3B + 3D) = \dfrac{129}{1.80}$
Remaining work $= \dfrac{3}{4} - \dfrac{129}{180}$
$= \dfrac{135-129}{180} = \dfrac{6}{180} = \dfrac{1}{30}$
this will be done by A in $= \dfrac{1}{30} \times 10 = \dfrac{1}{3}$ days
so B worked for 3 days.

S69. Ans.(b)
Sol.
Let the C do in one day = $4y$ work
Let the D do in one day = $5y$ work
2 day work of C + D = $9y$
In 44 day they will complete $9y \times 22 = 198y$
In another $\dfrac{1}{2}$ days $2y$ work will be done
C will take $= \dfrac{200y}{4y}$ days = 50 day
D will take = 40 days.
C and D will complete work together in $= \dfrac{50 \times 40}{90} = \dfrac{200}{9}$
According to condition
$\dfrac{200}{9x} + \dfrac{200}{9 \times 2x} = 1$
$\dfrac{400 + 200}{18x} = 1$

S73. Ans.(d)
Sol.
Work done by A, C and E on Job Z $= \dfrac{2}{10} + \dfrac{2}{15} + \dfrac{2}{20}$

$$= \frac{12+8+6}{60}$$
$$= \frac{26}{60} = \frac{13}{30}$$
Remaining work done by B and D in $20x$ and $21x$
$$\frac{20x}{12} + \frac{21x}{18} = \frac{17}{30}$$
$$\frac{60x + 42x}{36} = \frac{17}{30} \Rightarrow 102x = 17 \times \frac{36}{30}$$
$$x = \frac{6}{30} = \frac{1}{5}$$
Required days $= 20 \times \frac{1}{5} = 4$ days

S74. Ans.(c)
Sol.
According to question
$$\frac{2}{10} + \frac{4x}{12} + \frac{3}{15} + \frac{3x}{18} + \frac{2}{20} = 1$$
$$\Rightarrow \frac{1}{5} + \frac{x}{3} + \frac{1}{5} + \frac{x}{6} + \frac{1}{10} = 1$$
$$\frac{6 + 10x + 6 + 5x + 3}{30} = 1$$
$$15x + 15 = 30$$
$$x = 1$$
Required difference $= 4x - 3x$
$$= 4 - 3 = 1$$

S75. Ans.(d)
Sol.
With new efficiency C will complete job in $= 12\ days$
3 days work of C and 1 day work of B = 1/3
Days required = 9 days

S76. Ans.(b)
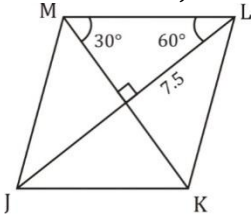Sol.
Rhombus PQRS:
Side of PQRS $= \dfrac{\sqrt{6^2 + 8^2}}{2}$
$$= \frac{10}{2} = 5 \text{ cm}$$
Rhombus MLKJ

$$\sin 30 = \frac{\text{perpendicular}}{\text{Hypotenuse}}$$
$$\frac{1}{2} = \frac{75}{\text{side of MLJK}}$$
Side of MLJK = 15 cm
Now, AB = 5 cm
CD = 15 cm
So median XY $= \dfrac{5 + 15}{2} = 10$ cm

S77. Ans.(c)
Sol.

After 20% of the contents of the vessel are removed,
Remaining contents $= \frac{80}{100}(12.5) = 10$ litres.
Ratio of water and milk in it = 1 : 4.
∴ It contains $\frac{4}{5}(10) = 8$ litres of milk and 2 litres of water.
To reverse the ratio, 2 litres of water must be made 32.
∴ x = 30 litres of water must be added.
To reverse this ratio again 8 litres of milk must be made 4(32) = 128 litres.
∴ y = 128 – 8 = 120 litres of milk must be added.

S78. Ans.(b)
Sol.
We can get ratio of investment from either statement B alone or C alone so profit of B can be determined from option b

S79. Ans.(d)
Sol.
From A and C we can determine the value ratio of efficiency between men, women and children from A & B we can also determine the value of ratio of men, women and children. We can calculate the answer from B and C.

S80. Ans.(c)
Sol.
From A
Total price $= \dfrac{3828 \times 100}{120}$
From C
$(x + y) - (x - y) = 28$
$y = 14$
And x+y = 90 (From B)
x =76
So total value can be determined