SUNDAY SUCCESS BOOSTER - QUANTITATIVE APTITUDE - 1708Q2

HINTS & SOLUTIONS

1. (2) Let the speed for the first hour be x km/hr.

then the speed for the second hour be $\frac{7}{5}x$ km/hr.

then the speed for the third hour be $\frac{10}{7}\times\frac{7}{5}x = 2x$ km/hr.

then the speed for the fourth hour be $2x\times\frac{7}{5}=\frac{14x}{5}$ km/hr.

Therefore total distance in four hours

$$= x+\frac{7}{5}x+2x+\frac{14x}{5}=\frac{36x}{5}\text{ km}$$

Therefore average speed

$$=\frac{\text{Total distance}}{\text{Total time}}=\frac{\left(\frac{36x}{5}\right)}{4}=\frac{9x}{5}\text{ km/hr.}$$

Again the distance in 4 hours @speed of x km/hr. which is half of the third hour's speed is 4x km.

Hence $\frac{36x}{5}-4x=160\text{ km}\Rightarrow x=50$

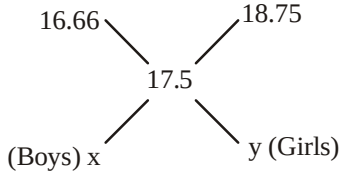
Hence the average speed $=\frac{9\times50}{5}=90\text{ km/hr.}$

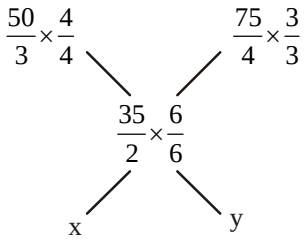
2. (1)

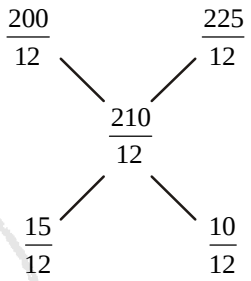
	No. of family members	Average	Total
11 years earlier	4	28	112
Presently	if 4	39	156
	6	28	168

Since it is obvious that just after the birth of the youngest member (i.e., child) was 6 family members in the family. Therefore at the time of birth of the youngest child the elder child's age was 6 years.
Now, the sum of their ages
= x + (x + 6) = 12 = (168 – 156)
⇒ x = 3 and (x + 3) = 9.

3. (2)



$\Rightarrow$ 

$\Rightarrow$ 

$\Rightarrow$ 3 : 2

Thus the no. of girls = 16 and no. of boys = 24.

4. (1)

Petrol	Kerosene	Total Mixture
99	x	99 + x
99	(x – 198)	(x – 99)

Again $\frac{99}{(x-99)}\times100-\frac{99}{(x+99)}\times100=13.33$

$$\Rightarrow 9900\left(\frac{x+99-x+99}{x^2-99^2}\right)=13.33$$

$$\Rightarrow\frac{9900(198)}{x^2-99^2}=\frac{40}{3}$$

$$\Rightarrow x^2-99^2=99^2\times15\Rightarrow x^2=(99)^2\times16$$

$\therefore x=99\times4=396$ litres

Therefore the actual concentration of petrol

$$=\frac{99}{99+396}=20\%$$

5. (5) Bobby :

Milk		Water
1	:	1
50%		50%
(2)		(2)
60%		40%
(3)	:	(2)

It means bobby will add up 1 litre of milk, in 4 litre of initial mixture, to prepare 5 litres mixture in the ratio of 3 : 2.

Sunny :

Milk		Water
1	:	1
50%		50%

By replacement method,

$$\frac{2}{5}=\frac{2}{4}\left(1-\frac{k}{4}\right)\Rightarrow\frac{4}{5}=\left(1-\frac{k}{4}\right)\Rightarrow\frac{1}{5}=\frac{k}{4}\Rightarrow k=\frac{4}{5}$$

It means Sunny will replace $\frac{4}{5}$ litre of initial mixture by the same quantity of pure milk.

Hence, the percentage of milk added by Bobby to that of replaced by Sunny $=\frac{1}{4/5}\times100=125\%.$

6. (3)

Urea			**Dia**		
N	P	K	N	P	K
x	y	0	20%	70%	10%

Mixture

N	P	K
26%	68%	6%

This 6% of K is obtained only from Dia.

Urea			**Dia**		
N	P	K	N	P	K
x	y	0	120	420	60

Mixture

N	P	K
260	680	60

$N_U+N_D=N_M\Rightarrow N_U+120=260$

N - Nitrogen, P - Phosphorus

and $P_U+P_D=P_M\Rightarrow P_U+420=680$

U, D, M - Urea, Dia and Mixture.

Therefor eamount of Nitrogen in Urea = 140

and amount of Phosphorus in Dia = 260

Therefore ratio of N : P = 7 : 13 = 35 : 65

7. (1) Total number of people = 10000

Business Man	10%	1000
Govt. Servant	13%	1300
Professionals	30%	3000
Students	45%	4500
Housewives	2%	200

LML	1200
SUZUKI	1200
BAJAJ	3000
HERO HONDA	6600

The total number of Hero Honda bikes = 6600

Total numbers of Government servants, housewives and students = 6000

Total no. of Businessmen and Professional = 4000

$\therefore$ Percentage of remaining (i.e., Businessmen and Professionals) driving Hero Honda

$$=\frac{600}{4000}\times100=15\%$$

8. (4) Let the no. of people who drive one, two and three bikes be 15k, 3k and k respectively.

Number of bikes which are being driven

= 15k + 2 (3k) + 3(k) = 24k

Since LML and Suzuki can not be driven by same person and a person can drive maximum 3 bikes.

Total bikes which are being used to drive = 12000

$24k = 12000 \Rightarrow k = 500$

Total number of people driving the bikes

= 15k + 3k + k = 19k = 9500

Number of people who do not drive any bike

= 10000 – 9500 = 500.

9. (2) From the pervious solution, number of people who drive more than 1 bike i.e., 2 bikes and 3 bikes are 1500 and 500 respectively.

These people have total 4500 bikes

= 1500 × 2 + 500 × 3

Hence, the remaining Hero Honda bikes

= 6600 – 4500 = 2100

Thus, the number of persons who drive single Hero Honda = 2100.

10. (1) Since 20% drive other bikes 80% drive only bajaj bike.

Number of people who drive only Bajaj bike

= 0.8 × 3000 = 2400

11. (5) SP

A		B		C
$\frac{1}{7}$ [8 / 7] $\frac{1}{8}$	:	$\frac{1}{8}$ [9 / 8] $\frac{1}{9}$	:	$\frac{1}{4}$ [5 / 4] $\frac{1}{5}$

Since $14.28\%=\frac{1}{7}$

So, the ratio of profit percentage of

A		B		C	
8	:	7	:	14	(Given)
↓		↓		↓	
$\frac{1}{7}$		$\frac{1}{8}$		$\frac{1}{4}$	

Thus the ratio of CP of A : B : C = 7 : 8 : 4

Therefore % profit $=\frac{(8+9+5)-(7+8+4)}{(7+8+4)}\times100$

$$=\frac{3}{19}\times100=15.78\%$$

12. (2) CP : SP = 3 : 4

Profit on 3 apples = Rs. 1 (consider CP = Rs. 1)

Profit = 33.33% and discount = 11.11%

CP : SP : MP = 3 : 4 : 4.5
Profit is double that of discount.
So, the percentage point difference
= 33.33% – 11.11% = 22.22% point.

13. (1) Charge of 1 call in February = $\frac{350}{150}=\frac{7}{3}$

Charge of 1 call in March

$$=\frac{350+50\times1.4}{250}=\frac{420}{250}=\frac{42}{25}$$

% cheapness of a call in March

$$=\frac{\frac{7}{3}-\frac{42}{25}}{\frac{7}{3}}\times100=28\%$$

14. (1) Fresh grapes :
Water : Pulp = 80% : 20% = 4 : 1
Dry grapes :
Water : Pulp = 25% : 75% = 1 : 3
Out of 20kg dry grapes, Water : Pulp = 5 kg : 15 kg
Required proportion of water and pulp,
80% : 20% = 4 : 1 = 60kg : 15kg
Thus to make dry grapes similar to the fresh grapes,
Akram requires 55 kg water with 20 kg of dry grapes.

So, the profit (%) $=\frac{55}{20}\times100=275\%$.

15. (3) CP : SP : MP = 500 : 576 : 900

Again SP = $\text{MP}\left[\left(1-\frac{r}{100}\right)^2\right]$

[r - rate of discount in %]

$$\Rightarrow 576=900\left(1-\frac{r}{100}\right)^2$$

$$\Rightarrow \frac{24}{30}=\left(1-\frac{r}{100}\right)\Rightarrow r=20\%$$

Again, new SP

$$=\text{MP}\left(1+\frac{r}{100}\right)^2=900\left(1+\frac{20}{100}\right)^2=1296$$

New profit percentage

$$=\frac{SP-CP}{CP}\times100=\frac{1296-500}{500}\times100=159.2\%$$

16. (3) $\frac{\text{Decreases in second year}}{\text{Decreases in third year}}=\frac{100}{100-r}=\frac{10}{9}$

$\Rightarrow r=10\%$
Let the population of vultures 3 years ago be P, then

$$P\left(1-\frac{10}{100}\right)^3=29160\Rightarrow P=40000$$

17. (2) $1000\rightarrow1100$
$\downarrow$
$2200\rightarrow2420$
$\downarrow$
$4840\rightarrow5324$
$\downarrow$
10648

18. (2) Interest paid by Ram Singh = Rs. 48000
Now go through option

$$48000=\frac{100000}{100}[6\times4+4\times6]\Rightarrow48000=48000$$

Hence proved that option (2) is correct. It means Ram Singh availed the discount after 4 years of loaning.

19. (3) Efficiency of Kaushalya = 5%
Efficiency of Kaikeyi = 4%
Thus, in 10 days working together they will complete only 90% of the work.
[(5 + 4) × 10] = 90
Hence, the remaining work will surley done by Sumitra, which is 10%.
Thus, Sumitra will get 10% of Rs. 700, which is Rs. 70.

20. (2)

T	C	B
16	10	15
8	12	12
128	120	180 [in one hour]
1280	1200	1800 [in 10 hour]

Since, restriction is imposed by composers i.e., since only 1200 books can be composed in 10 hours so not more than 1200 books can be finally prepared.

21. (3) To maximise the production we locate 5 persons for composing and 7 persons for typing. Only then we can maximise our production which is 1800 books per day.

T	C	B
(16+7)	(10+5)	15
8	12	12
184	180	180
1840	1800	1800

22. (4) 1st case

T	C	B
15	10	13
8	12	12
120	120	156
1200	1200	1560

No change in critical value

2nd case

T	C	B
16	10	12
8	12	12
128	120	144

No change in critical value

So, option (4) is correct.

23. (1) Combined efficiency of all the three boats = 60 passenger/trip.
Now consider option (1).
15 trips and 150 passengers means efficiency of $B_1 = 10\frac{p}{t}$ which means in carrying 50 passengers B_1 must has taken 5 trips. So the rest trips equal to 5 (10 – 5 = 5) in which B_2 and B_3 together carried remaining 250 (300 – 50) passengers.
Therefore the efficiency of B_2 and B_3

$$= \frac{250}{5} = 50\frac{p}{t}$$

Since, the combined efficiency of B_1, B_2 and B_3 is 60. Which is same as given in the first statement hence option (1) is correct.

24. (3) Here the length of the train in which passenger is travelling is not considered since we are concerned with the passenger instead of train. So, the length of the bridge will be directly proportional to the time taken by the passenger respectively.

Therefor $\frac{t_1}{t_2} = \frac{l_1}{l_2}$ (t - time, l - length of bridge)

$$\Rightarrow \frac{7}{4} = \frac{280}{x} \Rightarrow x = 160 \text{ m}$$

25. (1)

	First hour	Second hour	Third hour	Total
Initial Speed	x	3x	2x	6x
New Speed	3x	3x	3x	9x

Percentage increase in speed $= \frac{3x}{6x} \times 100 = 50\%$

Since speed is increased by (50%) = $\frac{1}{2}$.

Therefore, time will reduce by (33.33%) = $\frac{1}{3}$.

26. (2) Incorrect watch covers 1452 min in 1440 min.

So, it will cover 1 min in $\frac{1440}{1452}$ min.

Therefore it will cover 4840 min in

$$\frac{1440}{1452} \times 4840 = 4800 \text{ min} = 80 \text{ h}.$$

Therefore 80 h = 3 days and 8 h.

27. (1) Digit 2 can be arranged in two places out of 8 places in $\frac{^8P_2}{2!}$ ways.

Now, the remaining 6 places can be filled by the rest 3 digits in 3^6 ways.

Hence, the required number of ways

$$= \frac{^8P_2}{2!} \times 3^6 = {}^8C_2 \times 3^6 = 20412$$

28. (2) The possible ways are
25 × 4
22 × 4 + 2 × 6
19 × 4 + 4 × 6
16 × 4 + 6 × 6
13 × 4 + 8 × 6
10 × 4 + 10 × 6
7 × 4 + 12 × 6
4 × 4 + 14 × 6
1 × 4 + 16 × 6
Hence there are total 9 ways.

29. (2) E_1 = The event in which A speaks truth
E_2 = The event in which B speaks truth

Then $P(E_1) = \frac{60}{100} = \frac{3}{5}$, $P(E_2) = \frac{80}{100} = \frac{4}{5}$

and $P(\bar{E}_1) = \frac{2}{5}$, $P(\bar{E}_2) = \frac{1}{5}$

Required possibility

$$= P[(E_1 \cap E_2) \cup (\bar{E}_1 \cap \bar{E}_2)]$$

$$= P(E_1 \cap E_2) + P(\bar{E}_1 \cap \bar{E}_2)$$

$$= P(E_1) \cdot P(E_2) + P(\bar{E}_1) \cdot P(\bar{E}_2)$$

$$= \left(\frac{3}{5} \times \frac{4}{5}\right) + \left(\frac{2}{5} \times \frac{1}{5}\right) = \frac{14}{25} = 0.56$$

30. (2) Let E_i (i = 1, 2, 3 etc.) denote the event of drawing an even numbered card in i^{th} draw and F_i (i = 1, 2, 3) denote the event of drawing an odd numbered card in i^{th} draw, then required probability

$$= P[(E_1 \cap F_2 \cap F_3) \cup (F_1 \cap E_2 \cap F_3) \cup (F_1 \cap F_2 \cap E_3)]$$
$$= P(E_1)\, P(F_2)\, P(F_3) + P(F_1)\, P(E_2)\, P(F_3) + P(F_1)\, P(F_2)\, P(E_3)$$

$$= \frac{4}{9} \times \frac{5}{9} \times \frac{5}{9} + \frac{5}{9} \times \frac{4}{9} \times \frac{5}{9} + \frac{5}{9} \times \frac{5}{9} \times \frac{4}{9}$$

$$= 3 \times \frac{4 \times (5)^2}{(9)^3} = \frac{100}{243}.$$

31. (3) Toshiba sales in 1998 = 12% of 7890 = 946.8
In 1999 sales increases by 16.5% = 9191.85
Toshiba sales = 8% of 9191.85 = 735.34

% changes in sales = $\frac{946.8 - 735.34}{946.8}\% = 22\%$

32. (4) All of these.

33. (2) Ratio of Compaq sales (1998) to IBM salews (1999)

$$= \frac{1656.9}{1562.6} = 1.06$$

34. (4) Compaq has the maximum increase in sales from 21% of 7890 to 25% of 7890 × 1.165 => change of 641.

35. (4) IBM's sales in 1998 = 1341
Samsung's sales in 1999 = 2206

$$\text{In terms of \%} = \frac{1341}{2206}\times 100 = 60.8\%$$

36. (2) Average marks per candidate in 2001

$$= \frac{840\times 1000}{10000} = 84.$$

37. (4) The average marks per candidate of SBI PO from 1996 to 2001 has almost doubled.

38. (2)

39. (2) $\text{Average marks} = \frac{380-50}{6800-1800}\times 1000 = 66$

The closest option is (2).

40. (3) Average marks for OBC category

$$= \frac{5}{700}\times 1000 = 7.14\,.$$

The closest option is (3).

41. (2) The number of OBC candidates shows a fall in 2000.

42. (1) $\text{Average marks per student} = \frac{30}{1900}\times 1000 = 15.7 = 16.$

43. (4) $\frac{10000-6000}{6000}\times 100 = 66.6\%.$ Closest option is (4).

44. (2) The value has grown from 200 to 900, a growth of 350% during this time. This means a value of 100 has grown to become a value of approximately 450. A 35% growth rate applied to 100 mmakes it close to 450 in 5 years. Hence, option (2) would be the closest answer.

45. (1) Variation of total marks in 2000 to 2001 is approximately 250000. So total marks in 2002 if the same increase is repeated is 950000 + 250000 = 1200000. The closest option is (1).

46. (2) Total cubes = 160 + 56 = 216
Therefore the side of cube = 6 units
No. of cubes without any exposure = $(6-2)^3 = 64$
Thus 64 cubes will be inside of the big cube.
Now rest of the cubes = 160 – 64 = 96
Again the no. of cubes with one face outside
= 6 × (4 × 4) = 96

$$\text{Hence the required percentage} = \frac{96}{216}\times 100 = 44.44\%$$

47-50. (1) Ram + Sita = Laxman + Urmila and
Ram > Sita and Laxman > Urmila

(2) Horses :
(Ram + Sita) : (Laxman + Urmila)
= 3x : 2x = 18x : 12x
Again Ram have 1/3rd horses.
Therefore 30x × (1/3) = 10x
Then the horses of Sita = 18x – 10x = 8x
$\Rightarrow$ x = 1
The horses of Ram = 10 and Laxman = 5

(3) Chariots :
No. of chariots of Sita = No. of chiorts of Ram

$$= \frac{K}{5}$$

$$\text{and No. of chariots of Laxman} = \frac{K}{2}$$

Hence the no. of chariots of Urmila

$$= K - \left(\frac{K}{5}+\frac{K}{5}+\frac{K}{2}\right) = \frac{K}{10}$$

$$\text{Again } \frac{K}{2}-\frac{K}{10} = 20 \Rightarrow K = 50 \text{ chariots}$$

Now, the 50% property of Laxman = 25 chariots
= 2,00,000
Hence the total property of Laxman = 4,00,000
Thus, the area of Land of Laxman

$$= \frac{200000-5\times 20000}{5000} = 20 \text{ acre (1 lakh)}$$

Total property of Urmila = 140000 + 40000 + 80000
= 2,60,000
Thus the total property of Laxman and Urmila = 6.6 lakh.

Name	Horse	Chariot	Land	Total (in Rs.)
Ram	2 lakh (10)	80000 (10)	20 acre = 1 lakh	3.8 lakh
Sita	1.6 lakh (8)	80000 (10)	8 acre = 40000	2.8 lakh
Laxman	1 lakh (5)	2 lakh (25)	20 acre = 1 lakh	4 lakh
Urmila	1.4 lakh (7)	40000 (5)	16 acre = 80000	2.6 lakh

47. (1) 3.8 – 2.6 = 1.2 lakh.

48. (1) Value of chariots of Laxman = 2 lakh
Now since only Ram has the horses of worth Rs. 2 lakh. So only Ram can exchange with Laxman.

49. (3)

50. (5) $\frac{7.2-6.0}{6.0}\times 100 = 20\%$