SUNDAY SUCCESS BOOSTER - QUANTITATIVE APTITUDE - 10Q1
HINTS AND SOLUTIONS

### ANSWER KEY

1	(5)	11	(1)	21	(5)	31	(2)	41	(3)
2	(4)	12	(4)	22	(3)	32	(3)	42	(5)
3	(2)	13	(3)	23	(2)	33	(3)	43	(3)
4	(3)	14	(1)	24	(1)	34	(4)	44	(2)
5	(1)	15	(3)	25	(3)	35	(1)	45	(3)
6	(1)	16	(2)	26	(3)	36	(4)	46	(4)
7	(2)	17	(3)	27	(3)	37	(4)	47	(4)
8	(4)	18	(4)	28	(1)	38	(2)	48	(1)
9	(4)	19	(5)	29	(3)	39	(2)	49	(2)
10	(3)	20	(3)	30	(5)	40	(3)	50	(5)

1. (5) The probability that none of the retailer sends the gift in tme = $0.4 \times 0.2 \times 0.1 \times 0.5 = 0.0004$
The probability of receiving atleast one gift in time = $1 - 0.004 = 0.996$

2. (4) Let the manufacturing cost of the product be ₹ 100 and assume that the profit percentage of manufacturer is x, then he sells the product to retailer at ₹ $(100 + x)$. Since, the retailer sells the product at a profit of 23% so the price at which retailer sells is ₹ $1.23 \times (100 + x)$
Further, it is given that the retailer gives 10% discount to the customer, it means retailer sels the product at $(0.9) \times 155 = ₹ 139.50$.
So, we can infer that $1.23 \times (100 + x) = 139.5$.
Þ $x = 13.41 \approx 13\%$.

3. (2) Consider the following flow diagram :
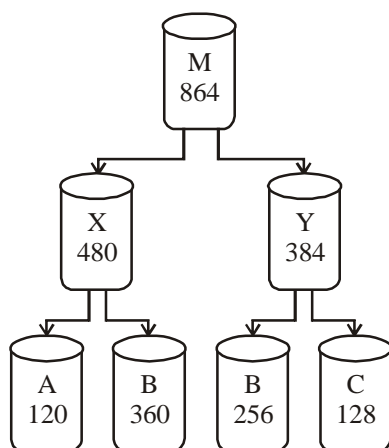
Total amount of B = $360 + 256 = 616$ units
Total amount of M = $2 \times 616 = 1232$ units
Total amount of water = $1232 - 864 = 368$ units

4. (3) Let us consider the principal amount be ₹ 20000.
Then, in first 3 years, it becomes ₹ 30000 (= 20000 + 10000), which is 1.5 times of ₹ 20000.
Then, in the next 3 years, (same amount of period), ₹ 35000 should become ₹ 45000, which is 1.5 times of ₹ 30000.
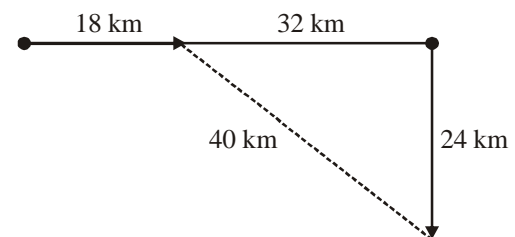As you can see that in first 3 years ₹ 20000 yields ₹ 10000 interest and in 6 years, ₹ 20000 yields ₹ 25000 interest at the same rate of interest.

5. (1) Consider the following diagram :
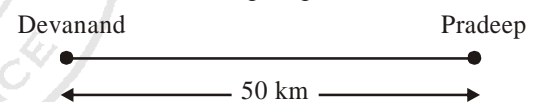
In Scenarios II and III, the minimum distance would be 50 km and it would further increase only.
Only in Scenario I, after 6 h of walk, both would be 40 km apart.

6. (1) We will try to give highest possible marks and then will move down in a decreasing order.

Condition	Marks	Rank
All questions are correct	30.00	1
1 question of 1 mark is wrong	28.75	2
1 question of 1 mark is left unattempted	28.50	3
1 question of 2 marks is left unattempted	27.66	4
2 questions of 1 mark is wrong	27.50	5

7. (2) Let there be n students and the student with roll number k got double sweets, where $0 < k \leq n$, then we have

$$\frac{n(n+1)}{2} + k = 1200 \Rightarrow n(n+1) = 2400 - 2k$$

Now, by hit and trial or close observation, you can easily figure out $n < 50$, as $n(n + 1) < 2400$.

Let us consider n = 49, then $n(n + 1) > 2400$

Now, if we consider n = 48, then

$n (n + 1) = 2352 \Rightarrow n(n+1) = 2400 - 48$

$\therefore n (n + 1) = 2400 - 2k \Rightarrow k = 24$

8. (4) If today, Rekha's age is 6y, then Ravindra's age is
6y + y = 7y

	10 yr ago	**Today**
Ravindra	5x	7y
Rekha	4x	6y

$$\therefore \frac{5x+10}{4x+10} = \frac{7y}{6y}$$

$$\Rightarrow \frac{5x+10}{4x+10} = \frac{35x}{30x} \qquad [\because y = 5x]$$

$$\Rightarrow \frac{5x+10}{4x+10} = \frac{7}{6}$$

Therefore, the current age of Ravindra is 35 yr and that of Rekha is 30 yr.

The age of triplets, twins and sixth child is 3k : 2k : k. But it has been just 10 yr to their marriage, so the age of each triplet cannot exceed 10 yr.

In that case, the maximum ages of each of the triplets, each of the twins and the sixth child are 9 yr, 6 yr and 3 yr, respectively.

Therefore, the greatest possible value of the present total age of this family = 35 + 30 + 3(9) + 2(6) + 3 = 107 yr.

9. (4) Initially, total amount of pure milk = 40 L

Every time, he replaces 10 L of milk (or its mixture) by 10 L of pure water.

It means after every such operation, the quantity of milk in the total mixture becomes 3/4th.

As there are 4 such operations, therefore the net amount of milk in the mixture = $40\left(\frac{3}{4}\right)^4 = 40\left(\frac{81}{256}\right)$ L

Since, the 5th customer purchases only 10 L amount of the mixture, therefore the amount of milk he receives

$$= 10\left(\frac{81}{256}\right) = \frac{405}{128} \text{ L}$$

10. (3) As soon as 60 gallons of water fills in the ferry, it will sink. Since 15 gallons of water is already filled in, so only 45 gallons of water is needed to sink.

Further, we know that water enters at the rate of 10 L/h, so we have maximum 4.5 h before the ferry sinks.

In te first 1.5 h, ferry has travelled 27 km [=1.5 × (20 – 2)], as the ferry was going against the stream.

Therefore, in remaining 4.5 h, ferry has to traverse 73 km (=100 – 27) till it reaches V and 100 km till it comes back to K from V.

K ●———●———●———●———●———● V

Upstream →   Downstream ←
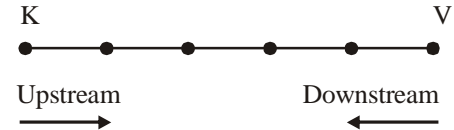
Now, we can go through the given choices.

Option (1), $\frac{73}{40-2} + \frac{100}{39+2} = 4.36$

Option (2), $\frac{73}{41-2} + \frac{100}{38+2} = 4.37$

Option (3), $\frac{73}{42-2} + \frac{100}{36+2} = 4.46$

Option (4), $\frac{73}{35-2} + \frac{100}{39+2} = 4.63$

(4) is invalid, as feery will sink, if it takes more than 4.5 h.

As per (1) and (2), ferry reaches too early to save time, which is unnecessary as ferry has 4.5 h to complete its trip. So, most appropriate is (3).

11. (1) Total number of possible telephone numbers of 8 digits = 10^8

Total number of telephone numbers with no repetition of any digit = $^{10}P_8 = 1814400$

Therefore, the number of telephone numbers in which atleast one digit is repeated = $10^8 - 1814400 = 98185600$.

12. (4) Consider the following diagram
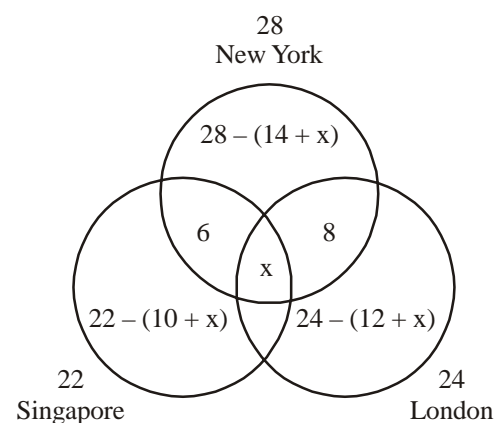
Let us consider the number of consultants who are covering all the cities be x, then

[22 – (10 + x) + 28 – (14 + x) + 24 – (12 + x)]
$\qquad$ + (6 + 8 + 4) + x = 42

$\Rightarrow 28 - (14 + x) = 7$

$\therefore x = 7$

13. (3) Let us consider P be the original amount.
Now, we know that it takes 12 yr to become 2P at the

rate of 6% compound interest, as $\dfrac{72}{6} = 12$

∴ P $(1.06)^{12} = 2P$

$\Rightarrow$ P $(1.06)^{12} = P[(1.06)^{12}]^4 = (2)^4$ P = 16 P

It shows that in 48 yr, the principal amount grows to become 16 times. That's how in 12 yr, 30 akh becomes 480 lakh.

14. (1)

Day	Number of students
1	1
2	3
3	6
4	10
⋮	⋮
20	210

∴ $1 + 3 + 6 + 10 + ... + 210 = \dfrac{20 \times 21 \times 22}{6} = 70 \times 22$

From the above equation, we find that the number of STUDENT-DAYS or MAN-DAYS = 22×70

If MBA students are twice as efficient as Engineering students, the nummber of days taken by 11 students = 70.

15. (3) Total revenue

$= \dfrac{1}{5} \times 5400 \times 250 + \dfrac{4}{5} \times 5400 \times 0.25 \times 250 = 1080000$

Net revenue after 30% discount of vendors
= 0.7 × 1080000 = 756000

∴ Loss = 800000 – 756000 = 44000

∴ Loss per cent = $\dfrac{44000}{800000} \times 100 = 55\%$

16. (2) Distance traversed till the 1st rebound = $32 = 2^5$ m
Distance traversed between 1st rebound and 2nd

rebound = $2 \times \dfrac{1}{2} \times 2^5 = 2^5$

Distance traversed between 2nd rebound and 3rd

rebound = $\dfrac{1}{2} \times 2^5 = 2^4$

Distance traversed between 3rd rebound and 4th

rebound = $\dfrac{1}{2} \times 2^4 = 2^3$

....
....

∴ Total distance covered till the 11th rebound

$= 2^5 + 2^5 + 2^4 + 2^3 + ... + 2^{-3} + 2^{-4}$

$= 2^5 + (2^5 + 2^4 + 2^3 + ... + 2^{-3} + 2^{-4})$

$= 2^5 + (2^5 + 2^4 + 2^3 + ... + 2+1) + \left(\dfrac{12}{4} + \dfrac{1}{8} + \dfrac{1}{16}\right)$

= 32 + 63 + 1 = 96

17. (3) Required number of combinations
= Total number of cases – Number of cases in which Raj and Rani both are included in a team
$= (^8C_3 \times {}^7C_4) - (^7C_2 \times {}^6C_3) = 1540$

18. (4) Number of Foreign Tourist visited Jaipur in 2011

$= 52314 \times \dfrac{12}{100} = 6277.680$

Number of Foreign Tourist visited Jaipur in 2013

$= 71253 \times \dfrac{19}{100} = 13538.070$

Number of Indian-National Tourist visited Madurai

in 2014 $= 36503 \times \dfrac{87}{100} = 31757.610$

Required Percentage

$= \dfrac{31757.610 - 6277.680 - 13538.070}{31757.610} \times 100 = 38\%$

19. (5) Number of Foreign Tourists who visited Attukal,

in year 2010 $= 37346 \times \dfrac{9}{100} = 3361.14$

in year 2011 $= 48932 \times \dfrac{12}{100} = 5871.84$

in year 2012 $= 51406 \times \dfrac{10}{100} = 5140.6$

in year 2013 $= 52315 \times \dfrac{8}{100} = 4185.2$

in year 2014 $= 55492 \times \dfrac{13}{100} = 7213.96$

in year 2015 $= 57365 \times \dfrac{11}{100} = 6310.15$

in year 2016 $= 58492 \times \dfrac{14}{100} = 8188.88$ (Max.)

Number of National tourists who visited Taj in 2010

$= 65139 \times \dfrac{76}{100} = 49505.66$

Required percentage

$= \dfrac{49505.66 - 8188.88}{49505.66} \times 100 = 83\%$ (approx.)

20. (3) Number of Foreign Tourists visited Taj

in 2010 $= 65139 \times \dfrac{24}{100} = 15633.56$

in 2011 $= 58248 \times \dfrac{25}{100} = 16309.44$

in 2012 $= 63309 \times \dfrac{21}{100} = 13294.89$

in 2013 $= 70316 \times \dfrac{27}{100} = 18985.32$

in 2014 $= 69294 \times \dfrac{23}{100} = 15937.62$

in 2015 $= 59216 \times \dfrac{20}{100} = 11843.2$

in 2016 $= 61345 \times \dfrac{19}{100} = 11655.55$

Average number of Foreign Tourists visited Taj

$= \dfrac{103659.38}{7} = 14808.48$

In year 2010, 2011, 2013 and 2014 Tourists visited Taj is more than the Average tourists visited Taj over the year.

21. (5) Total Foreign tourists visited India in year 2012

$= 24800 \times \dfrac{15}{100} + 63309 \times \dfrac{21}{100} + 56469 \times \dfrac{23}{100}$

$+ 52368 \times \dfrac{25}{100} + 51406 \times \dfrac{10}{100}$

$= 3720 + 13294.89 + 12987.87 + 13092 + 5140.6$
$= 48235.36$

22. (3) Total number of tourists who visited Victoria memorial $= 363704$

Total number of female tourists who visited Victoria

memorial $= \dfrac{39}{100} \times 363704 = 141844.56$

Total number of tourists who visited Madurai = 203595
Total number of female tourists who visited Madurai

$= \dfrac{2}{5} \times 203595 = 81438$

Total number of female tourists who visited Madurai and Victoria memorial = 141844.56 + 81438 = 223282.56

23. (2) $x^2 - 7x - 6x + 42 = 0$
$\Rightarrow x(x - 7) - 6(x - 7) = 0$
$\Rightarrow x = 6, 7$
and $y = 6$
$\therefore x \geq y$

24. (1) $x^2 + 2x - x - 2 = 0$
$\Rightarrow x(x + 2) - 1(x + 2) = 0$
$\Rightarrow x = 1, -2$
$y^2 + 4y + 3y + 12 = 0$
$\Rightarrow y(y + 4) + 3(y + 4) = 0$
$\Rightarrow y = -3, -4$
$\therefore x > y$

25. (3) $3x^2 - 15x - 8x + 40 = 0$
$\Rightarrow 3x(x - 5) - 8(x - 5) = 0$

$\Rightarrow x = \dfrac{8}{3}, 5$

$2y^2 - 23y + 66 = 0$
$\Rightarrow 2y^2 - 12y - 11y + 66 = 0$
$\Rightarrow 2y(y - 6) - 11(y - 6) = 0$

$\Rightarrow y = 6, \dfrac{11}{2}$

$\therefore x < y$

26-28.

Games	Boys	Girls
Cricket	200	350
Football	268	--
Chess	275	300
Badmnton	--	375
Football + Hockey	--	100
Table-Tennis, Badminton, Carrom	--	375
Hockey, Tabe-Tennis, Carrom	257	--
Total	1000	1500

26. (3) No. of students playing more than one game
$= 100 + 375 + 257 = 732$

27. (3) Total No. of students playing Hockey = 100 + 257 = 357

Required % $= \dfrac{357}{2500} \times 100 = 14.28\%$

28. (1) Required Ratio = (275) : (375 + 375)
$= 275 : 750 = 11 : 30$

29. (3) Graduate femae populaton of state C

$= 24 \times \dfrac{15}{100} \times \dfrac{4}{9} = 1.6$ lakh

XII Std. female population of state C

$= 32 \times \dfrac{18}{100} \times \dfrac{5}{9} = 3.2$ lakh

$\therefore$ Required percentage $= \dfrac{1.6}{3.2} \times 100\% = 50\%$

30. (5) Total graduate population of state F

$= 24 \times \dfrac{14}{100} = 3.36$ lakh

XII Std. total population of state A

$= 32 \times \dfrac{15}{100} = 4.8$ lakh

$\therefore$ Required percentage $= \dfrac{3.36}{4.8} \times 100\% = 70\%$

31. (2) XII Std. pass male populaton of state E

$= 32 \times \dfrac{19}{100} \times \dfrac{9}{19} = 2.88$ lakh

XII Std. pass male population of state F

$= 32 \times \dfrac{20}{100} \times \dfrac{3}{5} = 3.84$ lakh

$\therefore$ Required percentage $= \dfrac{2.88}{3.84} \times 100\% = 75\%$

32. (3) Graduate male population of state A

$= 24 \times \dfrac{7}{12} \times \dfrac{16}{100} = 2.24$ lakh

XII Std. pass male population of state A

$= 32 \times \dfrac{15}{100} \times \dfrac{7}{16} = 2.1$ lakh

Sum $= (2.24 + 2.1)$ lakh $= 4.34$ lakh
Graduate female population of state A

$= 24 \times \dfrac{5}{12} \times \dfrac{16}{100} = 1.6$ lakh

XII Std. pass female population of state A

$= 32 \times \dfrac{15}{100} \times \dfrac{9}{16} = 2.7$ lakh

$\therefore$ Sum $= (1.6 + 2.7) = 4.3$ lakh
$\therefore$ Required rato $= 434 : 430 = 217 : 215$

33. (3) Graduate female population of state B

$= 24 \times \dfrac{18}{100} \times \dfrac{3}{8} = 1.62$ lakh

Graduate feamle populaton of state E

$= 24 \times \dfrac{20}{100} \times \dfrac{7}{6} = 2.1$ lakh

$\therefore$ Required percentage $= \dfrac{1.62}{2.1} \times 100\% = 77\%$

34. (4) $(+2)^2, (+4)^2, (+6)^2, (+8)^2$
$\therefore 131 + 10^2 = 231$

35. (1) $(-12), (-12 \times 3), (-12 \times 5), (-12 \times 7)$
$\therefore 291 - 12 \times 9 = 183$

36. (4) From I, $x + y = 5$
From II, $x^2 - y^2 = 15$
From III, $x - y = 3$
So, number can be 41 or 14.

37. (4) Let distance $= d$
Speed in still water $= x$
Speed in current $= y$

$\therefore \dfrac{d}{x} = 2$

From A. d given

From B. $\dfrac{d}{x + y} = $ given

From C. $y = $ given

38. (2) From I, $x \times y = 2400$ sq m

II. $d = \sqrt{x^2 + y^2} = 50$ m

III. $x : y = 3 : 2$
From any of these two statements, we can determined the value of length and breadth to fnd parameter.

39. (2) Let Sonia buys x strawberry flavored candies and y chocolate flavored candies, then you will have
$3.3x + 2.9y = 249$
Since, there is only one linear equation and two variables x and y, so you cannot solve this equation algebraically and hence you cannot get the values of x and y. However, with the help of given choices you can readily figure out the values of x and y. If you pick choice (b) and put $x = 57$ and $y = 21$, the above equation will be satisfied.

40. (3)
    C.P.   S.P.
    80x   90x
 (80x + 10)   (90x + 2)

$\therefore \dfrac{105}{100}(80x + 10) = 90x + 2$

$\Rightarrow 8400x + 1050 = 9000x + 200$

$\Rightarrow 600x = 850 \Rightarrow x = \dfrac{85}{60}$

$\therefore$ Required C.P. $= \dfrac{85}{60} \times 80 = \dfrac{4 \times 85}{3} = \dfrac{340}{3} = ₹113\dfrac{1}{3}$

41. (3) Krishna $\to 3x \times 2t \Rightarrow 6xt$
Nandan $\to x \times t \Rightarrow xt$
Ratio of theri profts $= 6 : 1$

$\therefore$ Required amount $= \dfrac{4000}{1} \times 7 = ₹28000$

42. (5) Let total populaton $= 100$
After first year $= 100 + 15 = 115$
After second year $= 115 - 23 = 92$
After third year $= 92 + 4.6 = 96.6$
$\therefore 100 \to 32000$

$\Rightarrow 96.6 \to \dfrac{32000}{100} \times 96.6 = 320 \times 96.6 = 30912$

43. (3) Let students appeared from school A $= 100$
Qualified students from school A $= 60$
Now, students appeared from school B $= 130$
And qualified students from school B $= 60 + 36 = 96$

$\therefore$ Required $\% = \dfrac{96}{130} \times 100 = \dfrac{960}{13} = 73\dfrac{11}{13}\%$
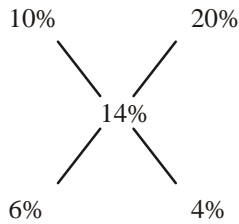
44. (2) Let original expencditure of mess for students $= x$
$\therefore (x - 1) \times 40 - 36x = 32$
$\Rightarrow 40x - 40 - 36x = 32$
$\Rightarrow 4x = 72 \Rightarrow x = 18$
$\therefore$ Required expenditure $= 18 \times 36 = ₹648$

45. (3) Let amount invested at 20% per annum = ₹ x

By mixture and allegative method

Ratio of amount = 3 : 2

∴ Total amount invested = $\frac{12000}{3} \times 5 = ₹20000$

46. (4) Let required no. of days = x

$$\frac{(x-5)}{10} + \frac{(x-2)}{12} + \frac{x}{15} = 1$$

$$\Rightarrow \frac{6x - 30 + 5x - 15 + 4x}{60} = 1$$

$$\Rightarrow 15x - 45 = 60 \Rightarrow 15x = 105 \Rightarrow x = 7 \text{ days.}$$

47. (4) Consider the following table :

Parties	2005		2010		Gain in vote share
	Number of votes	Percentage share	Number of votes	Percentage share	
A	343200	39.0	364450	37.0	–2
B	154000	17.5	241325	24.5	7
C	123200	14.0	162525	16.5	2.5
D	48400	5.5	54175	5.5	0
E	30800	3.5	49250	5.0	1.5
Others	180400	20.5	113275	11.5	–9
Total	880000	100.0	985000	100.0	

∴ B > C > E > D > A.

48. (1) Consider the folowing table :

Parties	2010				
	Positive tweets	Positive tweets (in %)	Negative tweets (in %)	Neutral tweets (in %)	No. of neutral tweets
A	131021	33.3	35.4	31.3	41009
B	108128	30.4	29.7	39.9	43143
C	96620	32.5	26.6	40.9	39517
D	41524	30.6	36.1	33.3	13827
E	32724	21.6	41.0	37.4	12238
Others	15000				
Total	425017				

Party B received maximum number of neutral tweets.

49. (2) Consiuder the following table

Parties	2000		2010		Gain in vote share
	Number of votes	Percentage share	Number of votes	Percentage share	
A	329700	42.0	364450	37.0	–5
B	133450	17.0	241325	24.5	7.5
C	196250	25.0	162525	16.5	–8.5
D	27475	3.5	54175	5.5	2
E	--	0 – 2	49250	5.0	3 – 5
Others	98125	12.5	113275	11.5	--
Total		100.0	985000	100.0	

In 2000, E must had less than 2% vote share.
In 2010, E had exactly 5% of vote share.
Therefore, the increase in vote share of E must be atleast 3% and atmost 5%.
Therefore, considering the choices, E can have increase of 3.5% and 4.5%. Further, it is obvious from the above table that the vote shares of B and D increase by 7.5% and 2%, respectively.

50. (5) Consider the following table :

Parties	2010				Required difference
	Number of votes	Percentage share	Number of tweets	Percentage share	
A	364450	37.0	131021	30.83	–6.16
B	241325	24.5	108128	25.44	0.94
C	162525	16.5	96620	22.73	6.23
D	54175	5.5	41524	9.77	4.22
E	49250	5.0	32724	7.70	2.7
Others	113275	11.5	15000	3.53	7.97
Total	985000	100.0	425017	100.0	

Going by the given choices, the maximum difference between the vote share and tweet share in 2010 is observed in 'Other parties'.