

Data Sufficiency

INTRODUCTION

Data sufficiency is not a new kind of problem. It is just a way to check your known reasoning ability in new format. In fact, in such problems two or more statements are given from different part of reasoning like coding, decoding, problem solving, blood relation, etc, and the examinee is required to find out if each statement alone/combinedly sufficient to answer the question. Let us the format of the problem given below:-

PROBLEM FORMAT

Directions: The problem(s) below consist of a question/questions followed by two statements labelled I and II. You have to decide if these statements are sufficient to answer the question.

Mark Answer:

- If statement I alone is sufficient to answer the question but statement II alone is not sufficient to answer the question.
- If only statement II is sufficient to answer the question but statement I is not sufficient to answer the question.
- If both statements I and II are together sufficient to answer the question although neither statement suffices by itself.
- If both the statements are sufficient to answer the question independently and separately.
- If both the statements are not sufficient but still more data is needed to answer the questions.

Example 1 : What is the age of x ?

Statements: I The age of y is 50 years.
II x is older than y .

After seeing the sample problem, you must have got the idea of what is the problem all about. But before solving the sample problem, we must solve some other problems related to this segment. Only the solution of some problems will give you the clear concept about this chapter. Let us see some examples of solutions given below:-

Example 2 : What is the date of birth of Rama?

Statements:

- Veena remembers that Rama's date of birth is between 17th June and 21st June.
- Surbhi says that Rama's date of birth is after 19th June but before 23rd June.

Sol. From I, we conclude that the possible answers are 18th June, 19th June, and 20th June. From II we come to the conclusion that 18th June and 19th June are ruled out. Hence, 20th June must be the answer clearly, both the statements are needed to answer the question but none of the two statements alone is sufficient to get the answer.

Example 3 : Who is the heaviest among L, M, N and O?

Statements:

- M is heavier than L, but lighter than O.
- N is lighter than M.

Sol. Write statement I as

$O > M > L$ ('>' means heavier than) Write II as $M > N$

Now the two inequalities can be combined as

$O > M > N > L$ or $O > M > L > N$

But in either case O is the heaviest. Hence, I and II are together needed to answer the question but neither of the two statement alone can give the answer.

Example 4 : In which year was Rahul born?

Statements-I: Rahul at present is 25 years younger to his mother.

Statements-II: Rahul's brother, who was born in 1964, is 35 years younger to his mother.

- Statement (I) ALONE is sufficient, but statement (II) alone is not sufficient.
- Statement (II) ALONE is sufficient, but statement (I) alone is not sufficient.
- BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- EACH statement ALONE is sufficient.
- Statements (I) and (II) TOGETHER are NOT sufficient.

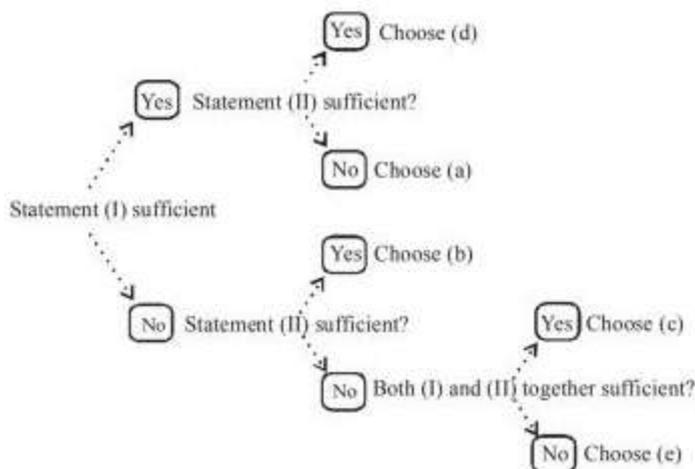
Explanation:

From both I and II, we find that Rahul is $(35 - 25) = 10$ years older than his brother, who was born in 1964. So, Rahul was born in 1954.

So answer is (c)

Data Sufficiency Decision Tree:

Assess each statement to determine whether it is sufficient or not, and this tree will lead you to the correct answer:



The Decision Tree is a helpful flowchart to ensure that your calculations and decisions lead you to the proper letter choice. To apply this system to the sample question:
The question asks a "What is the Year?" question, asking specifically for which year was Rahul born.

Statement -I : Rahul at present is 25 years younger to his mother, So statement (I) is not sufficient.

This means that you can eliminate choices (a) and (d), leaving only (b), (c), and (e).

Statement -II : Rahul's brother, who was born in 1964, is 35 years younger to his mother, So statement (II) alone is not sufficient and you can eliminate choice (b).

Taking the both statements I and (II) together, we find that Rahul is $(35 - 25) = 10$ years older than his brother, who was born in 1964. So, Rahul was born in 1954.

But keep in mind this, too - you don't have to! Since you know that by finishing these calculations you will arrive at one, exact answer, you've already proven that the statements together (but not alone) are sufficient, so you can save yourself the calculation and immediately choose answer choice (c). That's the Decision Tree in action, and keep in mind that once you've used it on a handful of questions it should start to sink in. Many students find it helpful to run through this process quickly by simply jotting down AD / BCE on their note board and eliminating one side of the slash after statement 1, then progressing through the elimination from there.

EXERCISE

DIRECTIONS (Qs. 1-15): Each of the questions below consists of a question and two statements numbered I and II given below it. You have to decide whether the data provided in the statements are sufficient to answer the question.

Read the question and both the statements and give answer.

- (a) If the data in statement I alone are sufficient to answer the question, while the data in statement II alone are not sufficient to answer the question.
 - (b) If the data in statement II alone are sufficient to answer the question, while the data in statement I alone are not sufficient to answer the question.
 - (c) If the data either in statement I alone or in statement II alone are sufficient to answer the question.
 - (d) If the data even in both the statements I and II together are not sufficient to answer the question.
 - (e) If the data in both the statements I and II together are necessary to answer the question.
1. Akbar, Salim, Amjad and Amir are four friends. They sit around a table square in size. One person sits facing each side of the square. Which direction is Akbar facing?
 - I Akbar is opposite Amjad, who is on the immediate left of Amir, who is facing west.
 - II Salim is opposite Amir, who is on the immediate right of Amjad, who is facing North.
 2. What is Shiva's rank in a class of 52 students?
 - I Abdul, whose rank is 21st in the class, is ahead of Keshav by 4 ranks. Keshav is 9 ranks ahead of Shiva.
 - II Madhu is 29 ranks ahead of Shiva and Keshav is 9 ranks behind Shiva while Radhika stands exactly in the middle of Keshav and Madhu in ranks and her rank being 23.
 3. P is in which direction with respect to S?
 - I R is 3 km towards north of S. T is 7 Km towards west of R. P is 3 km towards north of R.
 - II P is 4 km towards west of Q, who is 5 m towards south of R. S is 2 km towards west of R.
 4. V, W, X, Y and Z are sitting in a row. If Y is sitting between Z and V, then who is sitting in the middle? (All are facing north)
 - I Z is sitting to the right of W, but on the left of Y.
 - II X always sits at either of the extreme ends. Neither Y nor W is an immediate neighbour of X.
 5. How far is Point M from Point Q?
 - I Point S is 7m to the south of Point M. Point T is 4m to the east of Point S. Point P is 4m to the north of Point T. Point Q is to the west of Point P. Point S is 4m to the south of Point Q.

- II.** Point R is 4m to the west of Point Q. Point S is 4m to the north of Point Q. Point X is 4m to the north of Point R. Point M is 6m to the east of point X.
6. In a certain code '13' means 'stop smoking' and '59' means 'injurious habit'. What is the meaning of '9' and '5' respectively in that code?
- I.** '157' means 'stop bad habit'.
II. '839' means 'smoking is injurious'.
7. On which date is A's Father's birthday?
- I.** A's mother correctly remembers that their A's father birthday is after 7th but before 11th December.
II. A correctly remembers that his father's birthday is after 5th but before 10th December.
8. Among M, K, B, D and W, who is the youngest?
- I.** B is younger than D.
II. W is younger than K but older than M.
9. What does 'Ne' stands for in the code language?
- I.** 'Na Ni Nok Ne' means 'I will tell you' and 'Ni Nok Ne Nam' means 'he will tell you' in that code language.
II. 'Ni Ne Mo Nam' means 'will he call you' and 'Ne Mok Sac Ni' means 'how will you go' in that code language.
10. Who amongst P, Q, R, S, T and U is the tallest?
- I.** P is taller than R and T but not as tall as U, who is taller than Q and S.
II. R is the third in height in the ascending order and not as tall as U, P and Q, Q being taller than P but not the tallest.
11. Who is paternal uncle of P?
- I.** P is brother of L, who is daughter of Q, who is sister of N, who is brother of S.
II. M is brother of K, who is husband of L, who is mother of G, who is sister of P.
12. Which codeword stands for 'good' in the coded sentence 'sin co bye' which means 'He is good'?
- I.** In the same code language 'co mot det' means 'They are good'.
II. In the same code language 'sin mic bye' means 'He is honest'.
13. K is in which direction of T?
- I.** P is towards South of T and towards East of N.
II. M is towards North of T and towards West of K.
14. Who is taller among P, Q, R, S & T?
- I.** S is shorter than Q. P is shorter than only T.
II. Q is taller than only S. T is taller than P and R.
15. What is the distance between point P and point Q?
- I.** Point R is 10 m west of point P and point S is 10 m north of point P.
II. Point Q is 10 m south-east of point R. Point S is 20 m north-west of point Q.

DIRECTIONS (Qs. 16-22): Each of the questions below consists of a question and two statements numbered I and II given below it. You have to decide whether the data given in the statements are sufficient to answer the questions. Read both the statements and-

- Give answer (a)** if the data to statement I alone are sufficient to answer the question, while the data in statement II alone are not sufficient to answer the question.
Give answer (b) if the data to statement II alone are sufficient to answer the question, while the data in statement I alone are not sufficient to answer the question.
Give answer (c) if the data either in statement I alone or statement II alone are sufficient to answer the question.
Give answer (d) if the data in both statement I and II together are necessary to answer the questions.
16. Eight people M, N, O, P, Q, R, S and T are seated around a circular table facing the center and are equidistant from each other. Who sits opposite to R?
- I.** R is second to the left of P who is neighbour of M and O.
II. S sits opposite to P and neighbour of N and Q.
17. Five letters - A, E, G, N and R are arranged left to right according to certain conditions. Which letter is placed third?
- I.** G is placed second to the right of A. E is to the immediate right of G. There are only two letters between R and G.
II. N is exactly between A and G. Neither A nor G is at the extreme end of the arrangement.
18. Six people - S, T, U, V, W and X are sitting around a circular table facing the centre. What is T's position with respect to X?
- I.** Only two people sit between U and W. X is second to the left of W. V and T are immediate neighbours of each other.
II. T is to the immediate right of V. There are only two people between T and S. X is an immediate neighbour of S but not of V.
19. How many students are there in the school?
- I.** The number of boys is 90 more than that of girls.
II. The percentage of boys to the percentage of girls is 145.
20. How many children are there between M and P in a row of children?
- I.** M is fifteenth from the left in the row.
II. P is exactly in the middle and there are ten children towards his right.
21. How is PRODUCT written in that code language?
- I.** In a certain code language, AIEEE is written as BJFFF.
II. In a certain code language, GYPSY is written as FXORX
22. Five friends Abhinav, Binod, Chinmoy, Dinesh and Ombir each have different incomes. Who among following earns most?
- I.** Abhinav earns more than Binod but not as much as Ombir and Chinmoy.
II. Dinesh earns more than Ombir and Chinmoy.

23. A five-storeyed building with floors from I to V is painted using four different colours and only one colour is used to paint a floor.

Consider the following statements :

1. The middle three floors are painted in different colours.
2. The second (II) and the fourth (IV) floors are painted in different colours.
3. The first (I) and the fifth (V) floors are painted red.

To ensure that any two consecutive floors have different colours

- (a) Only statement 2 is sufficient
- (b) Only statement 3 is sufficient
- (c) Statement 1 is not sufficient, but statement 1 along with statement 2 is sufficient
- (d) Statement 3 is not sufficient, but statement 3 along with statement 2 is sufficient

24. Three Statements S1, S2 and S3 are given below followed by a Question:

S1: C is younger than D, but older than A and B.

S2: D is the oldest.

S3: A is older than B.

Question:

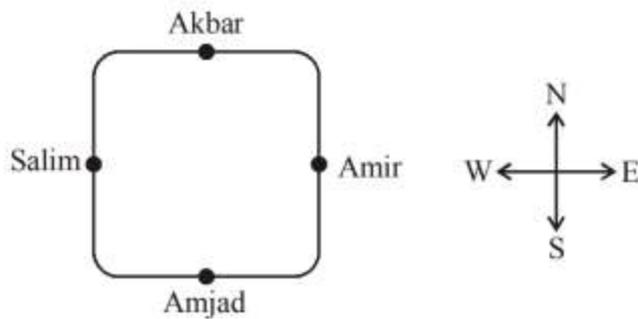
Who among A, B, C and D is the youngest?

Which one of the following is correct in respect of the above Statements and the Question?

- (a) S1 alone is sufficient to answer the Question.
- (b) S1 and S2 together are sufficient to answer the Question.
- (c) S2 and S3 together are sufficient to answer the Question.
- (d) S1 and S3 together are sufficient to answer the Question.

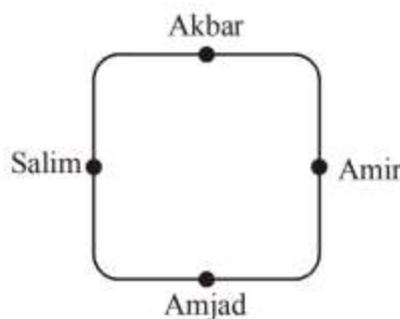
Hints & Solutions

1. (c) **From statement I :**



Hence, Akbar is facing south.

From statement II :



Hence, Akbar is facing south.

2. (c) **From statement I.**

Abdul → 21st rank

Keshav → 25th rank

Shiva → 34th rank

From statement II:

Radhika → 23rd rank

Madhu → $(x - 29)$ th rank

Shiva → x th rank

Keshav → $(x + 9)$ rank

Since, Radhika is exactly in the middle

of Madhu and Keshav,

Therefore,

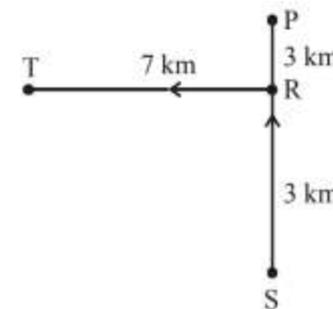
$$\frac{(x - 29) + (x + 9)}{2} = 23$$

$$\Rightarrow x - 29 + x + 9 = 46$$

$$\Rightarrow 2x - 46 = 20$$

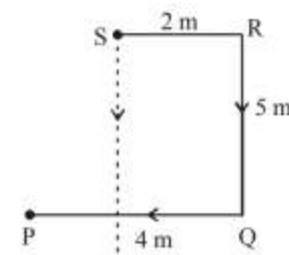
$$\Rightarrow x = 33$$

3. (c) **From statement I:**



Hence P is to the north of S.

From statement II.



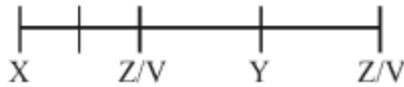
Hence P is to the southwest of S.

So, either alone I or II required.

4. (a) **From statement I :**
Statement I is sufficient to answer the question.

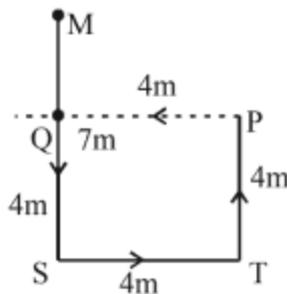


From statement II :



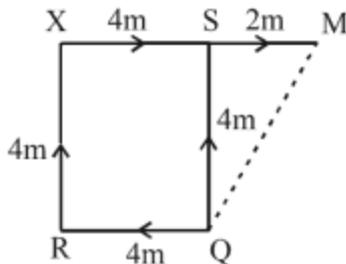
Statement II is not satisfied.

5. (c) **From statement I :**



$$\therefore MQ = 7 - 4 = 3\text{m}$$

From statement II :



$$\therefore MQ = \sqrt{4^2 + 2^2} = \sqrt{20} = 2\sqrt{5}\text{m}$$

6. (c) **From I :**
'157' 'Stop back habit'
'59' 'injurious habit'
thus the common code number '5' stand for 'habit'
So, '9' stand for 'injurious' thus statement I is sufficient

From-II :

'59' means 'injurious habit'
'839' means 'Smoking is injurious'
Thus '5' stand for 'habit' and '9' stand for 'injurious' so statement II sufficient to answer the questions.
Thus either statement I alone or statement II alone are sufficient to answer the question

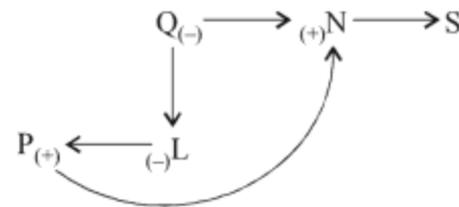
7. (d) A's father's Birthday may be on 8th or 9th December.

8. (d) **From I and II:** We get
 $D > B \dots (i)$
 $K > W > M \dots (ii)$
Still, we lack some clue as to whether B or M is the youngest.
Hence, both statements I and II even together are not sufficient.

9. (d) **From I:** Na Ni Nok Ne \rightarrow I will tell you ... (i)
Ni Nok Ne Nam \rightarrow he will tell you ... (ii)
From (i) & (ii) Na \rightarrow I and Nam = he
From II: Ni Ne Mo Nam \rightarrow will he call you ... (iii)
Ne Mok Sac Ni \rightarrow how will you go ... (iv)
Ne Ni is common in all the four statements. Exact transformation of Ne can't be determined.

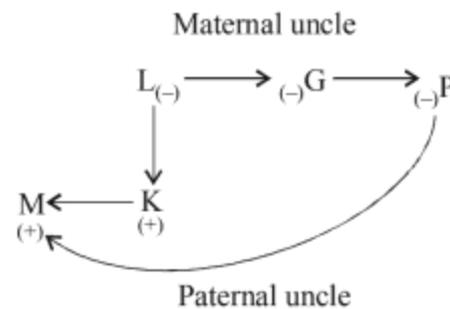
10. (c) **From I :** $P > R, P > T, U > P, U > Q, U > S$
 \rightarrow U is tallest. [Since U is taller than P, Q & S and P is taller than R and T]
From II : $R < U, P \& Q \dots (i); Q > P \dots (ii)$
From (i) and (ii) $R < P < Q < U$
Hence U is tallest.

11. (b) **From I :**



N is maternal uncle of P.

From II :



M is the paternal uncle of P

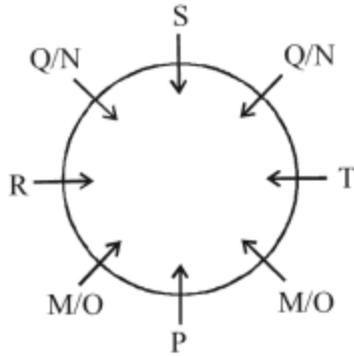
12. (c) Given: 'sin co bye' means 'He is good'
From I: 'co mot det' means 'They are good'
From II: 'sin mic bye' means 'He is Honest'
After a comparison between the given information and statement I we get 'co' is the code for 'good'. Similarly, after a comparison between the given information and statement II we get 'sin' and 'bye' as the codes for 'He' and 'is'. Thus 'co' is the code for 'good'.
13. (b) Statement I alone is not sufficient because the statement mentions nothing about K. Now, from II we get.
M - K
|
T
Thus, K is towards north-east of T.
14. (c) **From I :** P is shorter than only T, this means that P is taller than all Q, R & S, so T is tallest.

From II : Q only taller than S, so S is shortest, and Q is second shortest, Now T taller than P and R both, So tallest of all.

15. (d) **From I :** No relation between points P and Q

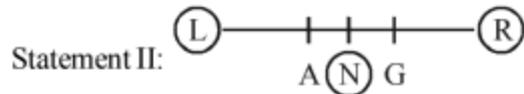
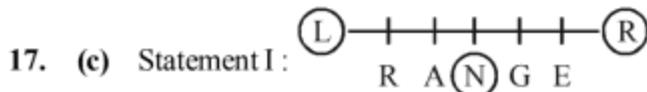
From II : In this since we don't know the angles between sides of triangle forming with points PQS and PQR, PQ cannot be determined.

16. (e) From both statement I and II

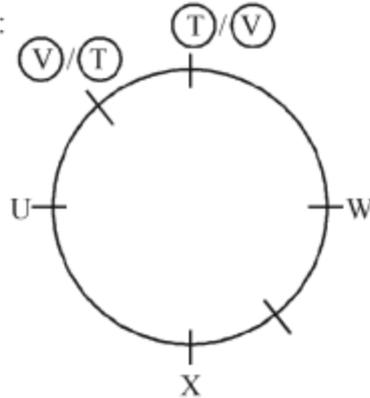


T sits opposite to R.

Both statement I and II together are necessary to answer the question

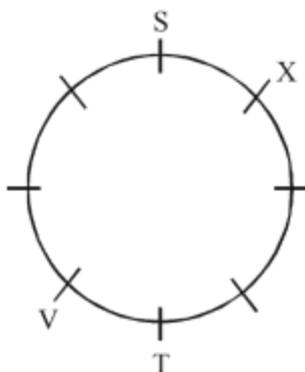


18. (b) Statement I:



From Statement I: We cannot get the exact position of T.

Statement II:



19. (e) I alone is not sufficient because we do not know about the number of girls. Similarly, II alone is not sufficient because the given information merely gives the ratio of boys and girls (145 : 100). Now combining I and II, we get $90 = 45\%$ of total girls.

Obviously, total strength = 245% of total girls

$$= \frac{90}{45} \times 245 = 490$$

Thus, both the statements are necessary.

20. (e) Statement I alone is not sufficient because it mentions only M's position in the row. Whereas statement II hints only the position of P in the row, ie $(10 + 1 =) 11$. Thus from I and II, we get required number of children = $(15 - 1) - 3 = 11$

21. (e) **From I:** All vowels are coded as next alphabets
From II: All consonants are coded as previous alphabets

So from both the statements.

22. (e) From both statement I and II
Chinmoy/Ombir > Abhinav > Binod (1)
Dinesh > Ombir/Chinmoy (2)
From (1) and (2)
Dinesh > Ombir/Chinmoy > Ombir/
Chinmoy > Abhinav > Binod
From equation (1) and (2) we conclude that Dinesh earns most.

23. (b) From statement (3), floor 1 and 5 are painted by the same colour red. Then, middle three floor 2, 3 and 4 must be painted in remaining three different colours.

Floor 5	Red
4	
3	
2	
1	Red

In that way, we get that any two consecutive floor have different colours.

24. (d) From $S_1 : D > C > A, B$
We get that D is oldest one among the given four persons.
From $S_3 : A > B$, B is younger than A.
From S_1 and S_3 , we get that,

$$\begin{matrix} D & C & A & B \\ \text{(oldest)} & & & \text{(youngest)} \end{matrix}$$

B is the youngest.