

## CHAPTER – 12

# INPUT AND OUTPUT

### Introduction

Some of the competitive examinations give questions on a pattern generally known as “Input and Output”. In these questions, input data is converted into output through a few systematic steps. In the directions for these questions, an example (to show how a given input is transformed into a designed output) will be given. The input is a string of elements (these elements can be alphabets or numbers or words or any combination of these), which is processed through a few methodical steps and transformed into the designed (pre-defined order of elements) output.

From the given example, we have to understand the following,

- (i) the method followed in the transformation; and
- (ii) the desired arrangement of the elements in the final output.

The same method is to be employed to answer the subsequent questions.

Now, let us analyse the two important phrases used in the above paragraph, viz., desired order of output and methodical transformation.

#### I. Desired order of output:

The form in which the final output is required, is pre-defined. The following are the most commonly followed arrangements of elements in the output.

- (a) If the elements are numbers:

- (i) Ascending order.
- (ii) Descending order.

- (b) If the elements are letters:

- (i) Alphabetical order: The elements appear in the same order as in a dictionary, from A to Z.
- (ii) Reverse Alphabetical order: The elements appear in the reverse order, from Z to A.

- (c) If the elements are words:

- (i) Alphabetical order: The words in the output are to be in the same order in which they appear in a dictionary, starting from A to Z.
- (ii) Reverse Alphabetical order: The words in the output are to be in the reverse order of the order given in a dictionary, starting from Z to A.

- (d) If the elements are a combination of letters, numbers and words, several kinds of arrangements are possible. On a case-to-case basis, we have to find out the arrangement in the output.

#### II. Methodical transformation:

To achieve the pre-defined output, the input string of elements is processed through a few steps. These steps follow a specific pattern while

rearranging the given elements. There are two most commonly followed methods. Let us name them as (1) Single element movement, and (2) Interchange of two elements. Students should note that there can be other methods of transformation. Now, let us discuss these two methods mentioned above with the help of a simple input “B D C A F E”. Let the desired output be “A B C D E F”.

1. **Single element movement:** In this method, only one element is rearranged in each step. The elements, which are to the left of the place vacated by the rearranged element, shift to their right to fill the vacant place. The positions of the other elements remain unchanged.

Illustration of this method:

Input : B D C A F E  
Step I : A B D C F E  
Step II : A B C D F E  
Step III : A B C D E F  
Step III is the final output.

In step one, letter ‘A’ is removed from its position and arranged in the first position. The three letters to the left of the vacant place i.e., B, D and C shift to their right by one place. Similar method is followed in subsequent steps.

2. **Interchange of elements:** In each step, the element to be rearranged interchanges its position with the element in its designated position. In this case, A interchanges its position with B and the positions of the other elements remain unchanged. This is the first step. Each of the subsequent steps follow the same methods till the final output is obtained.

Illustration of this method:

Input : B D C A F E  
Step I : A D C B F E  
Step II : A B C D F E  
Step III : A B C D E F  
Step III is the final step.

#### METHOD OF ANSWERING A QUESTION:

Step I : Compare Input and Output in the example given in the question and observe the final arrangement.

Step II: Observe how each element is being rearranged and also the pattern followed by the remaining elements.

Step III: Whenever an element comes into its designated position without consuming any step, then leave such element untouched.

Let us understand the concepts discussed above more clearly by using the following examples.

#### I. Arranging the words given in the input in alphabetical order:

**Example:** A word arrangement machine, when given an input consisting of words, rearranges them

following a particular pattern in each step. The following is an illustration of input and the steps involved in the rearrangement.

Input : belt an area the state are tea  
 Step I : an belt area the state are tea  
 Step II : an are belt area the state tea  
 Step III : an are area belt the state tea  
 Step IV : an are area belt state the tea  
 Step V : an are area belt state tea the  
 Step V is the final output (last step) for the above input.

Now, let us solve three questions based on the above model.

1. Which of the following will be the last step for the following input?

Input : from food has made case wage  
 (A) has made from food case wage  
 (B) case food from has wage made  
 (C) case food from has made wage  
 (D) case from food has made wage  
 (E) case food from made has wage

**Sol :** On comparing the input with the output, it is clear that the given words are arranged in alphabetical order. Hence, the output is 'case food from has made wage'. Choice (C)

2. Which step will be the last step for the following input?

Input : guide moral have that seems wag  
 (A) Step I (B) Step II (C) Step III  
 (D) Step IV (E) Step V

**Sol :** The method followed in rearrangement is as follows: The element to be rearranged, after reaching the designated position, pushes the other elements to its right. The given input goes through the following process to obtain the output. Arrows, as shown below, indicate the rearrangement that takes place in each step.

Input: guide moral have that seems wag  
 Step I: guide have moral that seems wag  
 Step II: guide have moral seems that wag  
 Step II is the final output. Choice (B)

## II. Arranging the numbers in the given input in increasing order:

### Example:

A number arrangement machine when given an input line of numbers, rearranges them following a particular pattern in each step. The following is an illustration of input and the steps involved in the rearrangement.

Input : 78 92 56 38 144 87  
 Step I : 38 92 56 78 144 87  
 Step II : 38 56 92 78 144 87  
 Step III : 38 56 78 92 144 87  
 Step IV : 38 56 78 87 144 92  
 Step V : 38 56 78 87 92 144

As all the numbers in the given input are arranged in the increasing order, step V is the final output.

Explanation: The numbers are arranged in the ascending order in the output. During rearrangement, only two numbers i.e., the number to be rearranged and the number in its designated place, interchange positions and the positions of the remaining numbers remain unchanged.

1. Which will be step IV for the input following?

Input : 144 786 325 86 645 284 93  
 (A) 86 93 144 284 325 645 786  
 (B) 86 93 144 284 786 325 645  
 (C) 86 93 284 144 325 645 786  
 (D) 86 93 144 284 645 325 786  
 (E) 86 93 645 284 144 325 786

**Sol :**

Input : 144 786 325 86 645 284 93

Step I: 86 786 325 144 645 284 93

Step II: 86 93 325 144 645 284 786

Step III: 86 93 144 325 645 284 786

Step IV: 86 93 144 284 645 325 786  
 Choice (D)

2. Which step will be the last step for the following input?

Input : 87 63 77 81 58 45  
 (A) Step VI (B) Step V (C) Step III  
 (D) Step II (E) Step IV

**Sol :**

Input : 87 63 77 81 58 45

Step I: 45 63 77 81 58 87

Step II: 45 58 77 81 63 87

Step III: 45 58 63 81 77 87

Step IV: 45 58 63 77 81 87  
 Choice (E)

3. Which of the following will be the first step, when the third step is 'fare gare hare tare mare pare'?

(A) gare hare fare tare mare pare  
 (B) gare hare tare mare pare fare  
 (C) mare hare gare pare tare fare  
 (D) tare fare gare hare mare pare  
 (E) None of these

**Sol :** The previous step cannot be found out because the initial arrangement of elements, as in the input, is not known. Choice (E)

## Exercise – 12

**Directions for questions 1 to 30:** Study the following information to answer the given questions.

A word/number arrangement machine, when given an input line of words, or numerals or a combination of both, rearranges them following a particular rule in each step. The following is an illustration of the input and the steps of rearrangement.

### Questions for 1 to 5:

Input : 1 11 21 31 41 51 61 71  
 Step I : 11 1 21 31 41 51 61 71  
 Step II : 21 1 11 31 41 51 61 71  
 Step III : 31 1 11 21 41 51 61 71  
 Step IV : 41 1 11 21 31 51 61 71  
 Step V : 51 1 11 21 31 41 61 71  
 Step VI : 61 1 11 21 31 41 51 71  
 Step VII: 71 1 11 21 31 41 51 61

Step VII is the final output. As per the rule followed in the above steps, answer the following questions.

- Which will be the final output for the following input?  
 Input : 38 14 56 12 92 39 114 43  
 (A) 12 14 38 39 43 56 92 114  
 (B) 14 12 39 38 56 43 114 92  
 (C) 43 38 56 14 12 92 39 114  
 (D) 43 38 14 56 12 92 39 114  
 (E) 43 14 56 38 12 92 39 114
- How many steps are required to get the final output for the following input?  
 Input: 18 7 13 97 86 42 59  
 (A) 6 steps (B) 7 steps (C) 8 steps  
 (D) 5 steps (E) 4 steps
- Which among the following will be the input if the final output is  
 "58 94 32 51 87 13 7 23" ?  
 (A) 7 13 23 32 51 58 87 94  
 (B) 94 87 58 51 32 23 13 7  
 (C) 7 13 32 23 51 87 94 58  
 (D) 94 32 51 87 13 7 23 58  
 (E) Cannot be determined
- If the first eight prime numbers are taken in ascending order as the input, then which of the following will be step IV of that input?  
 (A) 2 3 5 7 11 13 17 19  
 (B) 19 2 3 5 7 11 13 17  
 (C) 11 2 3 5 7 13 17 19  
 (D) 3 5 7 11 13 17 19 2  
 (E) Cannot be determined
- Which among the following is the last but one step for the following input?  
 256 159 386 125 81 64 121  
 (A) 121 256 159 386 125 81 64  
 (B) 81 256 159 386 125 64 121  
 (C) 125 256 159 386 81 64 121  
 (D) 386 256 159 125 81 64 121  
 (E) 64 256 159 386 125 81 121

### Questions for 6 to 10:

Input : adopted action to a stamp drafted general operation  
 Step I : a adopted action to stamp drafted general operation  
 Step II : a to adopted action stamp drafted general operation  
 Step III : a to stamp adopted action drafted general operation

Step IV: a to stamp action adopted drafted general operation

Step IV is the last step for this input.

In accordance with the rule followed in the above steps, answer the following questions.

- Which of the following will be the last step for the following input?  
 Input : post followed after government fallen nomination the of  
 (A) of the post after followed government fallen nomination  
 (B) of the post after fallen followed nomination government  
 (C) of the post after fallen followed government nomination  
 (D) of the post fallen after followed government nomination  
 (E) of the post fallen followed after government nomination
- Which step will be the last step for the following input?  
 Input : prime has the who suspect center attack forces  
 (A) Step III (B) Sep V (C) Step VI  
 (D) Step VII (E) Step VIII
- Which among the following will be step IV for the following input?  
 Input : sites related found pottery global tourism declare complex  
 (A) found sites global complex declare pottery related tourism  
 (B) found sites global complex declare pottery tourism related  
 (C) found sites global complex related pottery tourism declare  
 (D) found sites global related pottery tourism declare complex  
 (E) found sites global complex declare related pottery tourism
- Which among the following will be the input, if the step II for an input is "have made happy orders quiet these with them"?  
 (A) happy have orders made quiet these with them  
 (B) happy orders have made quiet these with them  
 (C) quiet orders have made happy these with them  
 (D) quiet orders have made happy with these them.  
 (E) Cannot be determined
- Which among the following steps has the following rearranged words "at do is we fund life exact your," for the input "we do at is exact fund your life"?  
 (A) Step III (B) Step VI (C) Step VII  
 (D) Step V (E) None of these

### Questions for 11 to 15:

Input : global signed 148 356 points 93 higher 68  
 Step I : global 356 148 signed points 93 higher 68  
 Step II : global 356 higher signed points 93 148 68

Step III: global 356 higher 148 points 93 signed 68  
 Step III is the final output.  
 In accordance with the rule followed above, answer the following questions.

11. Which among the following will be the last step for the input  
 "enough 59 87 subscribed 137 176 issues offered"?  
 (A) enough 59 issues 87 offered 137 subscribed 176  
 (B) enough 176 issues 137 offered 59 subscribed 87  
 (C) enough 176 issues 137 offered 87 59 subscribed  
 (D) enough 176 issues 137 offered 87 subscribed 59  
 (E) Cannot be determined
12. How many steps are required to get the final output for the following input: "actions 59 crunch price 137 every sales 347 236"?  
 (A) 8 steps (B) 7 steps (C) 6 steps  
 (D) 5 steps (E) 4 steps
13. Which among the following will be the input, if the output is "friday 171 from 151 research 131 series 111 standard"?  
 (A) friday from 171 151 research 131 series 111 standard  
 (B) 171 151 research friday standard 131 from 111 series  
 (C) standard research 151 171 friday from 111 series 131  
 (D) series 111 131 Friday from standard 151 171 research  
 (E) Cannot be determined
14. Which among the following steps has the following arrangement  
 "director 834 indica 726 543 376 project product" for the input  
 "project product director 376 543 726 indica 834"?  
 (A) Step VI (B) Step V (C) Step IV  
 (D) Step III (E) Step VII
15. How many steps are required to get the final output for the input  
 "sat 726 rat 534 mat 684 gate 436 bite"?  
 (A) 6 steps (B) 7 steps (C) 5 steps  
 (D) 3 steps (E) 4 steps

#### Questions for 16 to 20:

Input : taking decision three clear expects happen next public  
 Step I : clear taking decision three expects happen next public  
 Step II : clear decision taking three expects happen next public  
 Step III: clear decision expects taking three happen next public  
 Step IV: clear decision expects happen taking three next public  
 Step V : clear decision expects happen next taking three public  
 Step VI: clear decision expects happen next public taking three  
 Step VI is the last step for this input.

In accordance with the rule followed in the above steps, answer the following questions.

16. Which of the following will be the last step for the following input?  
 Input : products retail growth share little option board base  
 (A) base board growth little products retail share option  
 (B) base board growth little option products retail share  
 (C) base board growth products retail share little option  
 (D) base board products retail growth share little option  
 (E) None of these
17. Which step will be the last step for the following input?  
 Input : chosen efforts count painful difficult ended total orders  
 (A) Step IV (B) Step III (C) Step V  
 (D) Step VI (E) Step VII
18. Which among the following will be the step III for the following input?  
 Input : that there this provide many flows now years  
 (A) flows many now provide that there this years  
 (B) flows many now provide this that there years  
 (C) flows now many provide that there this years  
 (D) flows many now that there this provide years  
 (E) None of these
19. Which among the following will be the input, if the output is "diving earn first flight learn sign while yourself"?  
 (A) flight first earn sign learn while diving yourself  
 (B) first flight sign earn learn while diving yourself  
 (C) yourself flight sign first learn earn while diving  
 (D) diving first yourself earn flight learn while sign  
 (E) Cannot be determined
20. Which of the following will be step IV, if the step II of an input is  
 "biggest bound company sounds revenue need grow with"?  
 (A) biggest bound company grow need revenue sounds with  
 (B) biggest bound company grow need with sounds revenue  
 (C) biggest bound company grow need sounds revenue with  
 (D) biggest company bound grow need sounds revenue with  
 (E) Cannot be determined

#### Questions for 21 to 25:

Input : 15 17 35 7 23 11  
 Step I : 16 15 38 3 28 5  
 Step II : 3 5 15 16 28 38  
 Step III : 9 15 45 48 84 114  
 Step IV : 9 6 9 12 12 6  
 Step V : 6 6 9 9 12 12  
 Step V is the output.

Answer the following questions based on the above information.

21. What is the output for the input: -6 11 15 20 24 33?  
 (A) 3 9 9 10 12 15  
 (B) 3 9 9 12 15 15  
 (C) 3 6 9 9 12 15  
 (D) 3 9 9 9 13 15  
 (E) None of the above
22. What is step I of an input if the step IV of that input is -3 12 15 9 9 6?  
 (A) 9 18 36 56 79 23  
 (B) 10 15 18 23 46 85  
 (C) 1 7 51 63 81 25  
 (D) 21 9 55 35 56 28  
 (E) Cannot be determined
23. What is step IV for the input: -9 18 36 54 27 45?  
 (A) 3 15 12 9 6 9  
 (B) 9 15 12 3 6 9  
 (C) 3 12 15 9 9 6  
 (D) 3 12 15 9 6 9  
 (E) 3 15 9 9 6 12
24. If 11 7 18 26 22 32 is the input, then how many steps are there in between to get the arrangement 6 9 9 12 15 9?  
 (A) Zero (B) Two (C) One  
 (D) Three (E) Four
25. What is the output if the step I for an input is: -18 21 8 17 50 26?  
 (A) 6 6 6 9 9 12  
 (B) 6 6 6 9 12 15  
 (C) 6 6 9 9 12 15  
 (D) 6 6 6 9 15 6  
 (E) 6 6 6 9 9 15

#### Questions for 26 to 30:

Input: solution feasible practical category statement  
 condition problem view  
 Step I: view feasible practical category statement  
 condition problem solution  
 Step II: view condition practical category statement  
 feasible problem solution  
 Step III: view condition category practical statement  
 feasible problem solution  
 Step IV: view condition category feasible statement  
 practical problem solution  
 Step V: view condition category feasible solution  
 practical problem statement  
 Step VI: view condition category feasible solution  
 practical statement problem  
 Step VI is the final output.  
 In accordance with the rule followed in the above steps,  
 answer the following questions.

26. What will be the output for the following input?  
 Input: "law and ignorance the have that action such"  
 (A) such that the and law ignorance have action  
 (B) such the and that law have ignorance action  
 (C) such that the law and ignorance have action  
 (D) that the such and law ignorance action have  
 (E) None of these

27. Which among the following is step II, if step IV of the input is "number the will output be step input final"?  
 (A) number output step will be the input final  
 (B) number the will output final step input be  
 (C) number the will output final step be input  
 (D) number the output will final step be input  
 (E) None of these
28. Which among the following will be step IV for the following input?  
 Input: "poor many so are left this world there"  
 (A) there this are so left many world poor  
 (B) there this are many left so world poor  
 (C) there are this many left so world poor  
 (D) there many this are left so world poor  
 (E) None of these
29. Which among the following steps has the following rearranged words "India USA Japan France Germany Cuba China Italy" for the input "Italy Cuba France Japan Germany USA China India"?  
 (A) Step V (B) Step III (C) Step IV  
 (D) Step VI (E) Step II
30. What will be the input if the output is "Pune Varanasi Goa Delhi Indore Mumbai Patna Bhopal"?  
 (A) Indore Patna Goa Mumbai Delhi Bhopal Varanasi Pune  
 (B) Indore Goa Mumbai Delhi Patna Bhopal Varanasi Pune  
 (C) Indore Mumbai Delhi Goa Patna Bhopal Varanasi Pune  
 (D) Indore Delhi Mumbai Goa Patna Varanasi Bhopal Pune  
 (E) Cannot be determined

**Directions for questions 31 to 35:** Answer the questions based on the following information.

A number arrangement machine when given an input of a sequence of numbers applies a certain operation on them in a step wise method. An illustration of these step wise operations is given below. Understand the pattern and answer the following.

Input: 32 13 49 74 19 56  
 Step I: 13 32 74 49 56 19  
 Step II: 4 5 11 13 11 10  
 Step III: 5 4 13 11 10 11  
 Step IV: 10 8 26 22 20 22  
 Step V: 13 6 29 20 23 20  
 Step VI: 6 13 20 29 20 23

Step VI is the final output.

31. What is the output for the input given below?  
**Input : 97 65 85 17 27 28**  
 (A) 20 35 14 29 18 21  
 (B) 22 18 36 26 20 18  
 (C) 20 39 16 29 21 18  
 (D) 20 39 16 29 18 21  
 (E) 22 18 16 26 20 18
32. Which among the following is the step IV of the input given below?  
**Input : 66 22 51 43 79 68**  
 (A) 24 8 12 14 32 28  
 (B) 12 4 6 7 16 14  
 (C) 27 6 15 12 35 26  
 (D) 24 8 12 14 28 32  
 (E) 24 12 8 14 32 28

33. If step V of an input is: **41 58 63 38 89 82**, then what is the step I of that input?  
 (A) 19 30 20 30 43 42  
 (B) 19 30 30 20 43 42  
 (C) 33 17 23 28 45 41  
 (D) 19 30 20 30 42 43  
 (E) Cannot be determined
34. How many steps are required to obtain the arrangement **33 16 25 20 17 20** from the following input?  
**Input : 69 72 83 74 52 47**  
 (A) 3 steps (B) 5 steps (C) 2 steps  
 (D) 4 steps (E) None of these
35. Which is the third number from the left in step III, of the given input?  
**Input: 19 32 17 14 28 56**  
 (A) 5 (B) 4 (C) 9 (D) 8 (E) 10

**Directions for questions 36 to 40:** These questions are based on the information given below.

A word and number arrangement machine when given an input line of words and numbers rearranges them following a particular rule in each step. The following is an illustration of input and rearrangement (All the numbers are two digit numbers and are arranged as per some logic based on the value of the number).

Input: 56 slow and 61 steady 73 27 wins 32 run race 44

Step I: 73 56 slow and 61 steady 27 32 run race 44 wins

Step II: 61 73 56 slow and 27 32 run race 44 wins steady

Step III: 56 61 73 and 27 32 run race 44 wins steady slow

Step IV: 44 56 61 73 and 27 32 race wins steady slow run

Step V: 32 44 56 61 73 and 27 wins steady slow the race

Step VI: 27 32 44 56 61 73 wins steady slow run race and

Step VI is the last step of the arrangement for the above input.

**Directions for questions 41 to 45:** A machine when given an input of data processes it through several steps and gives an output as instructed below.

**Input:**

Step Number	Arrival time: 7:02 Departure time: 7:15	Arrival time: 7:25 Departure time: 7:32	Arrival time: 7:34 Departure time: 7:43	Arrival time: 7:46 Departure time: 7:54	Arrival time: 8:03 Departure time: 8:09
step I:	13	7	9	8	6
step II:	26	14	18	16	12
step III:	62	41	81	61	21
step IV:	63	43	84	65	26
step V:	9	7	12	11	8
step VI:	7	8	9	11	12
	arrival time: 7:25 departure time: 7:32	arrival time: 8:03 departure time: 8:09	arrival time: 7:02 departure time: 7:15	arrival time: 7:46 departure time: 7:58	arrival time: 7:34 departure time: 7:43

As per the rules followed in the above steps, find out in each of the following questions, the appropriate steps for the given input.

**Input for the questions:**

Input: situation 91 is 78 tense 14 32 but 63 under 81 control. (All the numbers given in the arrangement are two-digit numbers)

36. Which of the following would be step III?  
 (A) 81 91 situation is 78 14 32 but 63 control under tense  
 (B) 78 81 91 is 14 32 but 63 control under tense situation  
 (C) 63 78 81 91 14 32 but control under situation is tense  
 (D) 32 63 78 81 91 14 but under tense situation is control  
 (E) None of these
37. Which word/number would be at the eighth position from the right in step V?  
 (A) 14 (B) 81 (C) 91  
 (D) 63 (E) under
38. Which step number would be the following output? "63 78 91 14 81 but control 32 under is tense situation"  
 (A) There will be no such step  
 (B) III  
 (C) IV  
 (D) V  
 (E) II
39. How many steps are required to reach the final output?  
 (A) Five (B) Four (C) Seven  
 (D) Six (E) None of these
40. Which step number would be the following output? "63 78 81 91 14 32 but control under tense situation is"  
 (A) There will be no such step  
 (B) IV  
 (C) V  
 (D) VI  
 (E) None of these

Answer the following questions applying the same process as mentioned above.

41. Which of the following will be the output for the input given below?

Arrival time: 9:05	Arrival time: 9:23	Arrival time: 9:46	Arrival time: 10:00	Arrival time: 10:13
Departure time:9:16	Departure time: 9:30	Departure time:9:59	Departure time:10:14	Departure time: 10:19

(A)

Arrival time:9:05	Arrival time:10:00	Arrival time:9:46	Arrival time:9:23	Arrival time:10:13
Departure time:9:16	Departure time:10:14	Departure time:9:59	Departure time:9:30	Departure time:10:19

(B)

Arrival time:9:46	Arrival time: 9:23	Arrival time: 9:05	Arrival time: 10:00	Arrival time:10:13
Departure time:9:59	Departure time: 9:30	Departure time:9:16	Departure time:10:14	Departure time:10:19

(C)

Arrival time: 9:05	Arrival time: 10:13	Arrival time: 9:23	Arrival time: 10:00	Arrival time: 9:46
Departure time:9:16	Departure time: 10:19	Departure time: 9:30	Departure time:10:14	Departure time:9:59

(D)

Arrival time: 9:05	Arrival time: 9:23	Arrival time: 10:13	Arrival time: 9:46	Arrival time:10:00
Departure time:9:16	Departure time: 9:30	Departure time:10:19	Departure time:9:59	Departure time:10:14

(E) None of these

42. If one of the numbers in step VI is 9, then what is the position of 9 from the left end in step V.

- (A) Extreme left  
(B) Second from the left end  
(C) Third from the left end  
(D) Second from the right end  
(E) Cannot be determined

43. If 46 is fourth from the left end in step IV then which of the following can be the input?

(A)

Arrival time 07:21
Departure time 7:34

(B)

Arrival time 08:05
Departure time 08:16

(C)

Arrival time 08:32
Departure time 08:44

(D)

Arrival time 06:45
Departure time 7:56

(E) None of these

44. If step I of an input is 14 6 9 11 13, then which of the following is the step IV?

- (A) 83 23 81 22 62  
(B) 83 23 84 26 67  
(C) 81 23 84 26 67  
(D) 83 23 84 62 67  
(E) 23 83 62 84 67

45. If one of the number in the step III is 82, then find the corresponding number in step I.

- (A) 14 (B) 97 (C) 18  
(D) 16 (E) Cannot be determined

**Directions for questions 46 to 50:** A word/number operations machine when given an input string of words applies certain operations and given an output as instructed below.

Input:	TOPIC	BREAK	SHOULD	TAG	SECTION
Step I:	63	37	79	28	85
Step II:	65	40	84	35	96
Step III:	11	4	12	7	15
Step VI:	121	16	144	49	225
Step V:	116	11	139	44	220
Step VI:	11	44	116	139	220
Step VII:	BREAK	TAG	TOPIC	SHOULD	SECTION

Answer the following questions applying the same processes as mentioned above

46. Which among the following is the step III of the input given below?

Input:	KINDLY	ARRANGE	ITEMS	TO	OUR
(A)	14	11	8	6	11
(B)	13	12	6	8	11
(C)	14	13	8	6	11
(D)	22	8	14	7	8
(E)	15	17	6	9	4

47. Which of the following will be the fourth from the left end in the out put?

**Input:** WHICH HELPS IN THE PROBLEM  
(A) THE (B) WHICH (C) HELPS  
(D) IN (E) PROBLEM

48. If 16 is one of the numbers which is 2<sup>nd</sup> from the right end in step VI, then what is the position of the corresponding element of 16 in step IV?

(A) Third from the left end  
(B) Second from the left end  
(C) Extreme right  
(D) Fourth from the right end  
(E) Cannot be determined

49. The third number from the left in the step III is 11 then which of the following word can be the corresponding input of that number?

(A) IMAGE (B) CAN  
(C) MOCK (D) STATE  
(E) None of these

50. What is the output for the given input

**Input:** ROSE JASMINE LILLY MARIGOLD LOTUS

(A) LILLY JASMINE LOTUS ROSE MARIGOLD  
(B) LOTUS LILLY JASMINE ROSE MARIGOLD  
(C) JASMINE LILLY LOTUS MARIGOLD ROSE  
(D) LOTUS JASMINE LILLY MARIGOLD ROSE  
(E) None of these

**Directions for questions 51 to 55:** A machine when given a string of value processes it in several steps and given an output as shown below.

**Input:**

No of balls played	67	37	107	95	15	42
No of runs scored	51	74	118	80	33	54
Step I:	16	37	11	15	18	12
Step II:	16	74	33	60	90	72
Step III:	17	76	36	64	95	78
Step VI:	71	67	63	46	59	87
Step V:	8	13	9	10	14	15
Step V I:	8	9	10	13	14	15
No of balls played	67	107	95	37	15	42
No of runs scored	51	118	80	74	33	54

Note: Each number is a whole number

Answer the following questions applying the same processes as mentioned above

51. What is the output for the given input?

**Input:**

No of balls played	54	40	13	68	94	76
No of runs scored	27	43	31	56	77	61

(A)

No of balls played	40	54	13	94	76	68
No of runs scored	43	27	31	77	61	56

(B)

No of balls played	13	40	68	94	54	76
No of runs scored	31	43	56	77	27	61

(C)

No of balls played	68	40	94	54	13	76
No of runs scored	56	43	77	27	31	61

(D)

No of balls played	13	76	54	40	94	68
No of runs scored	31	61	27	43	77	56

(E) Cannot be determined

52. If one of the number is step IV is 46 find the step II number.

(A) 63 (B) 62 (C) 60  
(D) 54 (E) Cannot be determined

53. If step I of given input is 13 12 14 18 22 24 then which of the following is step VI.

(A) 5 6 7 8 9 13  
(B) 6 7 9 12 15 18  
(C) 5 8 9 13 7 6  
(D) 9 7 6 18 12 15  
(E) 18 6 9 7 5 13

54. If 54 is third element from the left end in IV, then which of the following can be the input?

(A)

No of balls played	62
No of runs scored	48

(B)

No of balls played	75
No of runs scored	62

(C)

No of balls played	59
No of runs scored	42

(D)

No of balls played	23
No of runs scored	57

(E) None of these

55. Which number would be at the 4<sup>th</sup> position from left end in step III for the given input?

**Input:**

No of balls played	118	65	27	5	27	92
No of runs scored	133	51	44	11	43	101

(A) 28 (B) 54 (C) 85 (D) 30 (E) 82



**Directions for questions 56 to 60:** A word arrangement machine when given an input set of words rearranges them in a particular pattern through a step by step process. Study the sample arrangement provided below and answer the following questions.

**Input:** BOTANICAL MUSEUM EXHIBITION THEATRE CIRCUS ELEPHANT

Step I: 20 9 25 12 8 15  
 Step II: 40 27 125 84 88 195  
 Step III: 42 31 131 92 98 207  
 Step IV: 24 13 131 29 89 702  
 Step V: 13 24 29 131 702 89  
 Step VI: 702 131 89 29 24 13

Step VII: ELEPHANT EXHIBITION CIRCUS THEATRE BOTANICAL MUSEUM

Step VII is the final output

As per the rules followed in the above steps, find out in each of the following questions, the steps for the given input.

Input for the questions:

**Input:** CUCUMBER LETTUCE VEGETABLE RADISH TOMATO BRINJAL

56. Which number would be the 4<sup>th</sup> from the right end in step IV?  
 (A) 901 (B) 601 (C) 241  
 (D) 106 (E) 04

57. Which of the following will be the output?  
 (A) TOMATO VEGETABLE BRINJAL RADISH CUCUMBER LETTUCE  
 (B) BRINJAL RADISH TOMATO CUCUMBER LETTUCE VEGETABLE  
 (C) RADISH TOMATO CUCUMBER VEGETABLE LETTUCE BRINJAL  
 (D) TOMATO BRINJAL VEGETABLE RADISH CUCUMBER LETTUCE  
 (E) None of these

58. Which of the following would be step IV?  
 (A) 23 601 04 46 901 241  
 (B) 23 04 601 46 901 241  
 (C) 04 23 46 601 241 901  
 (D) 32 40 106 64 109 142  
 (E) 04 23 601 46 901 241

59. Which step number would be the following output?  
 04 23 46 601 241 901  
 (A) step V (B) step IV  
 (C) step III (D) step VI  
 (E) There is no such step

60. How many words are there between TOMATO and RADISH in the output?  
 (A) One (B) Two (C) Three  
 (D) Four (E) Five

**Directions for questions 61 to 65:** A word and number arrangement machine when given an input of words and numbers arranges them following a particular rule. The following is an illustration of input and rearrangement. (All the given numbers are two digit numbers).

**Input:** march 92 april 46 may 83 june 69 76 july  
 Step I: may march 92 april 83 june 69 76 july 46

Step II: march may 92 april 83 june 76 july 46 69  
 Step III: june march may 92 april 83. july 46 69 76  
 Step IV: july june march may 92 april 46 69 76 83  
 Step V: april july june march may 46 69 76 83. 92  
 And step V is the last step for the given input.

As per the rules followed in the above steps find out in each of the following questions the steps for the given input.

Input for the questions:

**Input:** "one 46 two 38 three 83 four five 89 96" (All the numbers given in the arrangement are two digit numbers)

61. Which word/ number would be in 5<sup>th</sup> position from the right in step III?  
 (A) 96 (B) 89 (C) five  
 (D) four (E) 38
62. Which step number would be the following output?  
 "four one two three five 96 38 46 83 89"  
 (A) Step II  
 (B) Step III  
 (C) Step IV  
 (D) Step V  
 (E) there is no such step
63. Which of the following would be Step V?  
 (A) one two three four five 38 46 83 89 96  
 (B) one three two four five 89 96 38 46 83  
 (C) five four one three two 38 46 89 86 96  
 (D) five four one three two 38 46 83 89 96  
 (E) None of these
64. Which word/number would be at 7<sup>th</sup> position from the left in Step IV?  
 (A) four (B) two (C) 38  
 (D) 46 (E) None of these
65. Which of the following would be step II?  
 (A) three two one 83 four five 89 96 38 46.  
 (B) two one 46 three 83 four five 89 96 38  
 (C) one three two four five 89 96 38 46 83  
 (D) three two 83. one four five 89 96 38 46  
 (E) None of these

**Directions for questions 66 to 70:** Study the following information and answer the questions given below.

A word and number arrangement machine, when given an input line of words and numbers, rearranges them by following a particular pattern.

The following is an illustration of an input and its rearrangement.

**Input :** hallow 67 nail 34 pill 26 pace 61 kill 81

Step I: 67 nail 34 pill shallow 83 26 pace 61 kill  
 Step II: nail 34 pill shallow skill 69 83 26 pace 61.  
 Step III: 34 pill shallow skill snail 63 69 83 26 pace  
 Step IV: pill shallow skill snail space 36 63 69 83 26  
 Step V: shallow skill snail space spill 28 36 63 69 83  
 Step V is the final step for the given input.

As per the rules followed in the above steps, find out in each of the following questions, the appropriate steps for the given input.

Input for the questions:

"late 96 now 32 tick 9 sunsuit 15 tag 54 mall 97"

66. How many steps are required to get the output?  
 (A) Six (B) Seven (C) Five  
 (D) Eight (E) Four

67. What is the position of 'stick' in step V?  
 (A) Fifth from the right  
 (B) Seventh from the left  
 (C) Sixth from the right  
 (D) Sixth from the left  
 (E) None of these
68. How many elements are there between 'small' and '99' in step III?  
 (A) One (B) Two (C) Three  
 (D) Four (E) None of these
69. In step VI, in a certain way, if 'slate' is related to '99' and 'snow' is related to '56' then 'stag' is related to \_\_\_\_\_.  
 (A) stick (B) 11 (C) sunsuit  
 (D) 17 (E) 34
70. Which step number would be the following output?  
 '32 tick 9 slate small snow 56 98 99 sunsuit 15 tag'.  
 (A) I (B) II (C) III  
 (D) IV (E) There is no such step

**Directions for questions 71 to 75:** Study the following information to answer the given questions.

A word and number arrangement machine when given an input line of words and numbers rearranges them following a particular rule in each step. The following is an illustration of input and rearrangement. (All the numbers are two-digit numbers and are arranged as per some logic based on the value of the number.)

Input : vice 45 21 82 car got 35 ink 17 13 hard dance  
 Step I : 82 45 21 car got 35 ink 17 13 hard dance vice  
 Step II : 13 82 45 21 car got 35 17 hard dance vice ink  
 Step III : 45 13 82 21 car got 35 17 dance vice ink hard  
 Step IV : 17 45 13 82 21 car 35 dance vice ink hard got  
 Step V : 35 17 45 13 82 21 car vice ink hard got dance  
 Step VI : 21 35 17 45 13 82 vice ink hard got dance car  
 Step VI is the last step of the arrangement of the above input.

As per the rules followed in the above steps, find out in each of the following questions, the appropriate steps for the given input.

Input for the questions:

**Input:** fake 78 beat trick 30 26 card dart 46 64 hair 73  
 (All the numbers given in the arrangement are two-digit numbers.)

71. Which of the following would be step II?  
 (A) 26 78 beat fake 30 card dart 46 64 73 trick hair  
 (B) 26 78 fake beat 30 card dart 46 64 73 trick hair  
 (C) 26 73 fake beat 30 card dart 64 46 78 trick hair  
 (D) 73 26 78 beat card 30 dart 46 64 trick hair fake  
 (E) None of these
72. Which word/number would be at the sixth position from the left in step IV?  
 (A) 30 (B) card (C) dart  
 (D) 46 (E) 63
73. Which step number would be the following output?  
 '64 30 73 26 78 beat 46 trick hair fake dart card'  
 (A) There will be no such step.

- (B) IV  
 (C) III  
 (D) V  
 (E) II

74. Which of the following represents the position of 'hair' in step IV?  
 (A) Third from the left  
 (B) Fourth from the left  
 (C) Seventh from the left  
 (D) Third from the right  
 (E) Second from the right
75. How many elements (words or numbers) are there between 'beat' and 'hair' in step III?  
 (A) Two (B) Three (C) Four  
 (D) Five (E) Six

**Directions for questions 76 to 80:** These questions are based on the following information.

A word and number arrangement machine when given an input line of words and numbers rearranges them by following a particular rule in each step. The following is an illustration of an input and its rearrangement.

**Input:** camp goal 12 seat 28 real star 43 67 74 right 56  
 Step I: 73 camp goal 12 seat 28 real 43 67 right 56 ttar  
 Step II: 73 66 camp goal 12 28 real 43 right 56 ttar teat  
 Step III: 73 66 55 camp goal 12 28 real 43 ttar teat sight  
 Step IV: 73 66 55 42 camp goal 12 28 ttar teat sight seal  
 Step V: 73 66 55 42 27 camp 12 ttar teat sight seat hoal  
 Step VI: 73 66 55 42 27 11 ttar teat sight seal hoal damp

As per the rules followed in the above steps, find out in each of the following questions, the appropriate steps for the given input.

Input for the questions: month 25 march 44 may april june 31 63 july 56 99

76. What is the step number of the following output?  
 "98 62 55 25 44 april june 31 july north nay narch"  
 (A) I (B) II (C) III (D) IV (E) V
77. Which of the following is the second last step?  
 (A) 98 62 55 25 44 april june 31 july north nay narch  
 (B) 98 62 55 43 30 24 north nay narch kune kuly bpril  
 (C) 98 62 55 43 30 25 april north nay narch kune kuly  
 (D) 98 62 55 43 25 april 31 july north nay narch kune  
 (E) 98 62 25 march 44 april june 31 july 56 north nay

78. If the element '98' is related to '55' in a certain way, then in the same way how is the element '30' related to in step VI?  
 (A) nay (B) 24 (C) nonth  
 (D) kune (E) 55
79. Which of the following is the correct order of numbers in step II?  
 (A) 98 62 25 44 31 56  
 (B) 98 25 31 63 56 44  
 (C) 98 62 55 25 44 31  
 (D) 98 62 55 43 30 25  
 (E) None of these
80. How many elements are there between '55' and '31' in step IV?  
 (A) Two  
 (B) Three  
 (C) One  
 (D) Four  
 (E) None

### **Key**

- |       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 1. D  | 17. A | 33. E | 49. C | 65. A |
| 2. A  | 18. D | 34. B | 50. D | 66. A |
| 3. D  | 19. E | 35. D | 51. C | 67. D |
| 4. C  | 20. C | 36. B | 52. E | 68. C |
| 5. E  | 21. E | 37. C | 53. A | 69. E |
| 6. C  | 22. E | 38. A | 54. A | 70. C |
| 7. C  | 23. C | 39. D | 55. A | 71. B |
| 8. E  | 24. D | 40. B | 56. B | 72. B |
| 9. E  | 25. E | 41. D | 57. A | 73. D |
| 10. D | 26. A | 42. E | 58. B | 74. D |
| 11. D | 27. E | 43. C | 59. A | 75. E |
| 12. E | 28. B | 44. B | 60. B | 76. C |
| 13. E | 29. B | 45. A | 61. B | 77. C |
| 14. C | 30. D | 46. C | 62. E | 78. C |
| 15. D | 31. A | 47. D | 63. D | 79. A |
| 16. B | 32. A | 48. E | 64. C | 80. B |