LOGICAL REASONING

Module-1

PW

Design & Arch
POWERED BY PHYSICSWALLAH

Study Material

NIFT, NID, UCEED, NATA, JEE MAINS PAPER 2, JEE AAT

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Alphabet Test

INTRODUCTION

This chapter explores questions related to the positioning and opposites of letters in the English alphabet, as well as patterns in letter sequences, number sequences, and combinations of letters, numbers, and symbols. In these types of questions, students are asked to determine the position of a letter or word using various arrangements. This problem type requires students to identify letters or words based on different forms of arrangement. Additionally, the chapter covers several types of alphabetical organization, including arranging words alphabetically, problems involving letter words, alphabetical puzzles, finding letter pairs, and forming new words, among others.

Types of Questions based on the Alphabet Test

1. Alphabetical Series
2. Alphabetical order of Words
3. Letter-Word Problems
4. Meaningful Words
5. Pairs of Letters
6. Miscellaneous

Alphabetical Series

This series consists solely of letters that follow a consistent pattern. Students need to identify this pattern to find the correct answer. They may also be asked to determine the position of the English letter located to the right or left of the letter given in the question.

Some important points to solve these types of questions:

1. The English Alphabetical series is the sequence of 26 letters from A to Z. One way to solve this question is to assign a number to each letter, starting from 1 for A and ending with 26 for Z. For example, A = 1, B = 2, ..., Z = 26.

Place Value of the English Alphabetical Series from A to Z / left to right

A	B	C	D	E	F	G	H	I	J
1	2	3	4	5	6	7	8	9	10
K	L	M	N	O	P	Q	R	S	T
11	12	13	14	15	16	17	18	19	20
U	V	W	X	Y	Z				
21	22	23	24	25	26				

2. The reverse English Alphabetical order is Z (1), Y (2), X (3), ..., C (24), B (25), A (26).

3. To learn the place value the word given below is just the arrangement of the alphabets having position multiples of 5. From this word, we can learn the position of 26 letters.

E	J	O	T	Y
5	10	15	20	25

4. To learn the place value of one more word given below in which the arrangement of letters has occupied positions in the multiple of 3.

C	F	I	L	O	R	U	X
3	6	9	12	15	18	21	24

5. The opposite letters in the English Alphabetical Series are the letters that have a sum of 27 when their positions are added. For example, A is the first letter and Z is the 26th letter, so A + Z = 1 + 26 = 27. Therefore, A and Z are opposite letters. Similarly, B and Y, C and X, D and W, and so on are opposite letters.

Opposite Letters in the English Alphabetical Series.

A-Z	AmaZon
B-Y	BoY
C-X	CraX
D-W	DeW
E-V	EVen

F-U	FUll
G-T	GeT
H-S	HiS
I-R	Indian Railway
J-Q	Joker Queen
K-P	KanPur
L-O	LOw
M-N	MooN

6. The starting point of the series is the left end and the ending point of the series is the right end.

7. To solve the question easily you should break the series into a combination of four-four or five-five elements.

8. **We can understand the problems based on alphabetical series by using these concepts:**

   (i) Element from the Left End – Element to the left of the Element from the Left End = Required Element from the Left End.

Example 1: Which of the following letters is fifth to the left of the seventeenth letter from the left end in the English alphabetical series?

    (*a*) R   (*b*) N   (*c*) L   (*d*) Q

Solution (*c*): Left End [A B C D E F G H I J K L M N O P Q R S T U V W X Y Z] Right End

17th element from the left end – 5th element left = 17 – 5 = 12th element from left is L.

   (ii) Element from the Right End – Element to the Right of the Element from the Right End = Required Element from the Right End.

Example 2: Which of the following letters is second to the right of the thirteenth letter from the right end in the English alphabetical series?

    (*a*) R   (*b*) P   (*c*) T   (*d*) Q

Solution (*b*): Left End [A B C D E F G H I J K L M N O P Q R S T U V W X Y Z] Right End

13th element from the right end – 2nd element right = 13 – 2 = 11th element from right is P.

(iii) Element from the Left End + Element to the Right of the Element from the Left End = Required Element from the Left End.

Example 3: Which of the following letters is fourth to the right of the tenth letter from the left end in the English alphabetical series?

    (*a*) N   (*b*) S   (*c*) T   (*d*) Q

Solution (*a*): Left End [A B C D E F G H I J K L M N O P Q R S T U V W X Y Z] Right End

10th element from the left end + 4th element right = 10 + 4 = 14th element from left is N.

(iv) Element from the Right End + Element to the left of the Element from the Right End = Required Element from the Right End.

Example 4: Which of the following letters is third to the left of the sixteenth letter from the right end in the English alphabetical series?

    (*a*) O   (*b*) J   (*c*) H   (*d*) M

Solution (*c*): Left End [A B C D E F G H I J K L M N O P Q R S T U V W X Y Z] Right End

16th element from the right end + 3rd element left = 16 + 3 = 19th element from right is H.

Brain Buzz

Directions: Study the following arrangement carefully and answer the questions given below:

Z 7 Y # U 2 V 5 4 % S U © F 9 W 8 @ T R H N L D K 9 * J 1 G

If all the numbers are dropped from the above arrangement, Which of the following elements is seventh to the left of the tenth element from the right end in the series?

    (*a*) %   (*b*) S

    (*c*) F   (*d*) L

Ans. (*a*)

ALPHABETICAL ORDER OF WORDS

Alphabetical ordering is a useful technique for organizing information, looking up words in a dictionary, or arranging names in a list. This system arranges words based on the order of letters in the English alphabet, which consists of 26 letters from A to Z. When sorting words alphabetically, the initial letters of each word are compared. The word with the first letter that appears earlier in the alphabet is placed before the word whose first letter appears later. For example, "Edit" comes before "File" because "E" precedes "F" in the alphabet.

If two words share the same initial letter, the second letters are then compared. The word with the second letter that appears earlier alphabetically is placed before the word with the later second letter. For instance, "Eager" comes before "Eared" because "G" is earlier in the alphabet than "R."

Arranging words in alphabetical order involves following a simple procedure. Here are the steps:

1. **Identify the Words:** Clearly see and list out all the words that you need to arrange.

2. **First Letter Comparison:** Look at the first letter of each word. Place them in order based on their positions in the alphabet. Words starting with 'A' come first, followed by 'B,' and so on.

First letters: Apple, Banana, Cat, Dog

3. **If the First Letters or More than the First Letters are the Same:** If the first letters are the same, move to the second letter and compare. Continue this process until you find the point of difference.

Words: Apple, Apply, Appeal, Application

Word	1	2	3	4	5	6	7	8	9	10	11
APPLE	A 1	P 16	P 16	L 12	**E 5**						
APPLY	A 1	P 16	P 16	L 12	**Y 25**						
APPEAL	A 1	P 16	P 16	**E 5**	A 1	L 12					
APPLICATION	A 1	P 16	P 16	L 12	**I 9**	C 3	A 1	T 20	I 9	O 15	N 14

According to the table above, the word 'APPEAL' comes first based on the fourth letter. Finally, based on the fifth letter, the words are ranked as follows: 'APPLE' is second, 'APPLICATION' is third, and 'APPLY' is last.

Therefore, the correct order is APPEAL, APPLE, APPLICATION, and APPLY.

4. **Shorter Words First:** If one word is a prefix of another (e.g., "cat" and "cattle"), the shorter word comes first.

Example 5: Arrange the following words in alphabetical order.

A.	Serene	B.	Sequoia
C.	Summery	D.	Second
(*a*)	D, A, C, B	(*b*)	D, C, A, B
(*c*)	D, B, A, C	(*d*)	B, C, D, A

Solution (*c*): Arrange the following words in alphabetical order:

(*a*) Second (*b*) Sequoia (*c*) Serene (*d*) Summery

To arrange words in alphabetical order, we compare the letters of the words from left to right. The word that has the letter that comes earlier in the alphabet is placed before the word that has the letter that comes later in the alphabet. For example, "bat" comes before "cat" because "B" comes before "C" in the alphabet.

In this question, all the words start with "S," so we need to compare the second letters of the words. The second letters are "E," "E," "U," and "E." Except for one, they are all the same. Therefore, the word that comes last is "Summery ."

Now, we need to compare the third letter of the remaining words. The third letters are "R," "Q," and "C." The letter "C" comes before "R" and "Q" in the alphabet, so "Second" is placed before "Sequoia," and "Serene" in alphabetical order. Therefore, the word that comes first is "Second."

Next, we compare "Sequoia" and "Serene" The third letters of these words are "Q" and "R." Since "Q" comes after "R" in the alphabet, "Serene" is placed after "Sequoia" in alphabetical order. Thus, the word that comes second is "Sequoia," and the word that comes third is "Serene."

So, the correct order is D. Second B. Sequoia A. Serene C. Summery

Therefore, the required answer is option (c) D, B, A, C.

Brain Buzz

Directions: From the given alternatives, according to the dictionary, which word will come at the 'Fourth' position from the right end?

1.	Gentle	2.	Genuine
3.	Gate	4.	Geothermal
5.	Gain		
(*a*)	Geothermal	(*b*)	Gate
(*c*)	Gentle	(*d*)	Genuine

Ans. (*b*)

LETTER-WORD PROBLEMS

The questions in this category deal with different ways of arranging the letters within a given word. This may involve arranging the letters in either alphabetical or reverse alphabetical order. Additionally, we may be asked to replace the letters with the next or previous letter in the sequence.

Example 6: If all the digits of the number **436216578** are arranged in increasing order, then the sum of 2nd, 4th and 8th digits (from the left end) of the number thus formed, is in new arrangement.

(*a*)	14	(*b*)	15
(*c*)	16	(*d*)	13

Solution (d): Given Number: 436216578

If all the digits of the number are arranged in increasing order we get,

New Number: 123456678

Sum of 2nd, 4th and 8th digits (from the left end) = 2 + 4 + 7 = **13**

Example 7: If each letter in the word **'HELPFUL'** is arranged in alphabetical order (from left to right), and then each vowel is changed to the previous letter in the English alphabetical series, and each consonant is changed to the next letter in the English alphabetical series, which of the following will be sixth from the left side of the new arrangement thus formed?

    (a) M   (b) Q   (c) I   (d) T

Solution (b): Arrange the letters in the word HELPFUL in alphabetical order. This will give us the word EFHLLPU.

Change each vowel to the previous letter in the English alphabetical series. This means that A becomes Z, E becomes D, I becomes H and U becomes T.

Change each consonant to the next letter in the English alphabetical series. This means that D becomes E, G becomes H, M becomes N, N becomes O, and T becomes U.

After Arrangement	E	F	H	L	L	P	U
	−1	+1	+1	+1	+1	+1	−1
Required Word	D	G	I	M	M	Q	T

So, the sixth letter from the left side is Q.

Therefore, the correct answer is Q.

MEANINGFUL WORDS

In this type of question, a word is given, and the objective is to form a meaningful word by rearranging the letters from the provided word. Essentially, the challenge is to pick certain letters from the given word and organize them to create a valid word.

Example 8: If a four-letter meaningful word can be formed by using the first, third, fourth, and sixth letters from the word "SATURDAY", then what is the last letter from the left end of the newly formed word? Mark X as your answer, if more than one word is formed. Mark Z, if no meaningful word can be formed.

    (a) T   (b) I   (c) X   (d) Z

Solution (c): To solve this question, we need to use the 1st, 3rd, 4th, and 6th letters of the word 'SATURDAY'. These letters are S, T, U, and D. We need to make a meaningful word using each letter only once.

S	A	T	U	R	D	A	Y
1	2	3	4	5	6	7	8

There are only two words that can be made with these letters: STUD and DUST. Both of these words are meaningful words in the English language.

So, more than one word can be formed.

Therefore, the correct answer is X.

PAIRS OF LETTERS

In this type of question, the goal is to find the number of letters in a given word that maintain the same relative distance as in the English alphabetical order, whether counting forward or backward. In simpler terms, these questions focus on identifying pairs of letters in a word where the gap between them mirrors the spacing between those letters in the English alphabet.

Example 9: How many such pairs of letters are there in the word **'COMPUTER'** which have as many letters between them in the word as in the English alphabet?

    (*a*) One   (*b*) Three

    (*c*) Four   (*d*) Two

Solution (*c*): The given word is **COMPUTER**.

We need to identify pairs of letters in **"COMPUTER"** where the number of letters between them in the word matches the number of letters between them in the English alphabetical sequence.

Let's examine the pairs both **forwards** and **backwards**:

Step 1: Find Pairs in the Word

  1. M and R: There are four letters between them in "COMPUTER" (P, U, T, E), and four letters between them in the English alphabet (N, O, P, Q). So, **M and R** form a pair.

  2. T and U: There are zero letters between them in "COMPUTER", and zero letters between them in the alphabet. So, **T and U** form a pair.

  3. R and T: There is one letter between them in "COMPUTER" (E), and one letter between them in the alphabet (S). So, **R and T** form a pair.

  4. R and U: There are two letters between them in "COMPUTER" (E, T), and two letters between them in the alphabet (S, T). So, **R and U** form a pair.

CONCLUSION

The pairs that satisfy the condition are:

❖ M and R   ❖ R and T

❖ T and U   ❖ R and U

Thus, there are **four** such pairs of letters in the word **COMPUTER**.

Example 10: How many such pairs of digits are there in the number "46791327", each of which has as many digits between them in the number (in both forward and backward directions) as they have between them in the number series?

    (*a*) Zero   (*b*) One

    (*c*) Two   (*d*) Three

Solution (*c*):

<div align="center">4 6 7 9 1 3 2 7</div>

Forward: 1 (6 to 7)

Backward: 1 (2 to 3)

Hence, **Two** is the correct answer.

MISCELLANEOUS CONCEPTS

In this segment, the questions are related to the placement of numbers, number pairs, and number arrangements, among other topics.

Example 11: How many such digits are there in the number **'735182469'** which will remain at the same position when arranged in ascending order from left to right?

    (*a*) One   (*b*) Two

    (*c*) Three   (*d*) Four

Solution (*a*): The given number is 735182469.

To solve this question, we need to compare the positions of the digits in the number '735182469' and in the ascending order from left to right. The ascending order from left to right is '123456789'. We need to find the digits that have the same position in both cases.

Given Number	7	3	5	1	8	2	4	6	9
New Number	1	2	3	4	5	6	7	8	9

So, the position of one digit 9 remains unchanged.

Therefore, the required answer is one.

Example 12: If in the word **'REMAINDERS'**, positions of the first and the second letter are interchanged, positions of the third and fourth letter are interchanged and so on the positions of 9th and 10th digits are interchanged, then which letter will be 5th from the left end?

    (*a*) A   (*b*) I

    (*c*) M   (*d*) N

Solution (*d*): Given word: REMAINDERS

After interchanging: ERAMNIEDSR

Hence, N will be 5th from the left end.

In the number '8451317468', if all the even numbers are arranged in ascending order from left, then all the odd numbers are arranged in descending order after that. Then, find the resultant when the fourth digit from the left end and third digit from the right end are added?

    (*a*) 13   (*b*) 15

    (*c*) 12   (*d*) 11

Ans. (*d*)

PRACTICE QUESTIONS

Easy

1. Which of the following letters is 5th to the right of the 12th letter from the left of the English alphabet when written from left to right?
   (*a*) P   (*b*) Q   (*c*) H   (*d*) E

2. Arrange the following words in the order in which they appear in an English dictionary.
   1. Meticulous   2. Metric
   3. Method   4. Mettle
   5. Meter
   (*a*) 5, 3, 1, 4, 2   (*b*) 3, 4, 5, 1, 2
   (*c*) 5, 3, 1, 2, 4   (*d*) 5, 1, 3, 2, 4

3. If we write the digits of the number "87546329" in ascending order then how many digit's positions will be unchanged?
   (*a*) One   (*b*) Two
   (*c*) Three   (*d*) Four

4. If a meaningful word can be formed using the 3rd, 4th, 6th and 8th letters of "**RAVISHMENT**", what will be the third letter from the left of the newly formed word? If more than one word is formed, mark your answer as X. If no meaningful word can be formed, mark your answer as Z.
   (*a*) H   (*b*) I
   (*c*) V   (*d*) X

Moderate

5. If all the letters of the word "CHAMPION" are arranged in English alphabetical order from left to right, then which is the 4th letter from the right end in the word thus formed?
   (*a*) N   (*b*) H
   (*c*) M   (*d*) I

6. If the last twelve letters of the English alphabet series are reversed, which of the following will be the tenth to the left of the sixth letter from the right end?
   (*a*) K   (*b*) N
   (*c*) L   (*d*) Z

7. In the number 42587369, if the digits at even positions, when considered from the left, each decreased by 1, then how many even digits will be there in the new number thus formed?
   (*a*) 1   (*b*) 2
   (*c*) 3   (*d*) 4

8. If the letters in the word 'UNIVERSAL' are arranged in the alphabetic order and each letter in the order is assigned a numerical value of according to their position from the left, then the sum of the numerical values of the position of the consonants will be:
   (*a*) 30   (*b*) 28
   (*c*) 32   (*d*) 31

Difficult

9. If all the vowels are replaced by the immediate next letter from the English alphabet and consonants are replaced by the immediate previous letter in the word INCONTROVERTIBLE, then the letters of the word are arranged alphabetically, which letter will be 5th to the left of the 6th letter from the right end?
   (*a*) F   (*b*) K
   (*c*) J   (*d*) P

10. How many such pairs of letters are there in the word 'PREPARED' each of which has as many letters between them in the word as in the English alphabet (Both forward and backward)?
   (*a*) None   (*b*) Three
   (*c*) Four   (*d*) Two

SOLUTION

1. (*b*) From the question: 12th letter from the left of the English alphabet - L

   5th to the right of L is - Q

   Hence, **Q** is the correct answer.

3

Coding and Decoding

PRACTICE QUESTIONS

Easy

1. In a certain code language, FLAG' is written as 'KQFL'. How to code 'TRUCK' in the same code language
   - (a) XWAJR
   - (b) YWAHR
   - (c) VWXLR
   - (d) YWZHP

2. In a code language, 'dark colors' is coded as 'yu nu', 'days are bright' is coded as 'wu tu ku', 'nights are dark' is coded as 'ku nu pu', 'paint bright' is coded as 'wu ru'. What is the code for the word 'days'?
   - (a) wu
   - (b) ku
   - (c) tu
   - (d) ru

3. In a certain code language, 'DESIGN' is written as 'TFEPIK' and 'DESIRE' is written as 'TFEGTK'. How will 'DEVICE' be written in that language?
   - (a) VEDGEK
   - (b) WFEGEK
   - (c) ECIVED
   - (d) VEDECI

4. In a certain code language, 'Broken' is written as '1171410413', 'Bottle' is written as '1141919114', how will 'Sample' be written in that language?
   - (a) 1711215114
   - (b) 1801215114
   - (c) 1801214114
   - (d) 1811114103

5. In a certain code language, RUMMY is written as QVLNX. How is CHESS written in that code?
   - (a) BIFRT
   - (b) BGDTR
   - (c) BGFTR
   - (d) BIDTR

Moderate

6. In a certain code language, 'BOSS' is coded as '2151919' and 'DEAL' is coded as '45112'. How will 'GAIN' be coded in that language?
   - (a) 16231
   - (b) 71241
   - (c) 71914
   - (d) 76231

7. If JPG = 19 and PNG = 23, then TIF = ?
   - (a) 23
   - (b) 20
   - (c) 15
   - (d) 13

8. If 'sky' is called 'cloud', 'cloud' is called 'thunder', 'thunder' is called 'water', 'water' is called 'pot', 'pot' is called 'desert', and 'desert' is called 'sky', then where do fish live?
   - (a) cloud
   - (b) pot
   - (c) water
   - (d) desert

9. In a certain code language, 'GALLARY' is written as 14-2-24-24-2-36-50. How will 'RANGER' be written in that language?
   - (a) 36228141036
   - (b) 12348141036
   - (c) 36223451036
   - (d) 36222341036

10. In a code language, REGULAR is written as GERTRAL. How will BROTHER be written as in that language?
    - (a) ORBSREH
    - (b) ROBSERH
   - (c) ORBUREH
    - (d) ORBEHTS

Difficult

11. In a code language, 'our son's car' is coded as 'fu da be', 'son's birthday today' is coded as 'la fu ja', 'today our match' is coded as 'he da la'. What is the code for the words 'car match'?
    - (a) da he
    - (b) fu be
    - (c) la he
    - (d) he be

12. In a certain code language, '4378' is coded as 'IDOL' and '7832' is coded as 'IDLE' What is the code for '2' in that code language?
    - (a) O
    - (b) L
    - (c) E
    - (d) I

13. If North is called West, West is called South and South is called East, then what will South-West be called as?
    - (a) South-East
    - (b) North-East
    - (c) North
    - (d) West

14. In a certain code language, 'ARCHAEOLOGY' is written as 'ZSCIZEBTOOL'. How will 'COMPOUNDING' be written in that language?
    - (a) LKMLXUTMIWN
    - (b) LKMLXUTMIKN
    - (c) LKMLXUTMIWM
    - (d) LKMLXUTMIFM

**15.** In a certain code language, 'DIFFER' is written as GCGCUG and 'DEVICE' is written as CCJSHE. How will 'PERMIT' be written in that language?

(*a*) FDJKDFD

(*b*) VTNKGHF

(*c*) CONOWK

(*d*) VDFGSKL

EXPLANATION

1. (*d*) The pattern followed by the following word pair is as follows:

```
F     L     A     G
+5|   +5|   +5|   +5|
K     Q     F     L
```

Similarly,

```
T     R     U     C     K
+5|   +5|   +5|   +5|   +5|
Y     W     Z     H     P
```
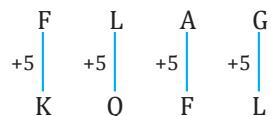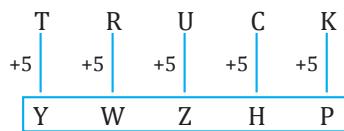
Hence, YWZHP is the correct answer.

2. (*c*) According to the question when we take 1,2,3,4 equations

1. 'dark colors' = 'yu nu',
2. 'days are bright' = 'wu tu ku'
3. 'nights are dark' = 'ku nu pu'
4. 'paint bright = 'wu ru'

according 2 and 3 are = ku

according 2 and 4 bright = wu

according only 2 days = tu

Hence, **tu** is the correct answer.

3. (*b*) The words given here are coded using a certain logic. And by using this logic we have to find out the code of the word DEVICE.

Logic used in the above Coding:

Here 1 is added to the first half letters of the word and 2 is added to the next half letters of the word, and the code word is obtained.

As,

DESIGN → TFEPIK

D   E   S   I   G   N
  +1   +2
+1 +1   +2 +2
T   F   E   P   I   K

And,
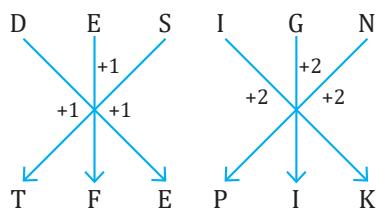
DESIRE → TFEGTK

D   E   S   I   R   E
  +1   +2
+1 +1   +2 +2
T   F   E   G   T   K
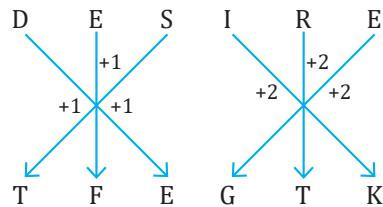
Similarly,

DEVICE → WFEGEK

D   E   V   I   C   E
  +1   +2
+1 +1   +2 +2
W   F   E   G   E   K
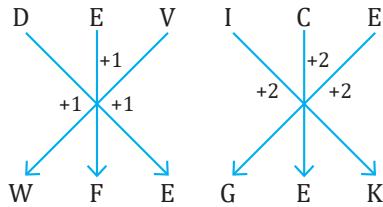
Hence, "WFEGEK" is the correct answer.

4. (*b*) Here the logic is as follows:

```
B    R    O    K    E    N   &  B    O    T    T    L    E
-1   -1   -1   -1   -1   -1     -1   -1   -1   -1   -1   -1
1    17   14   10   4    13     1    14   19   19   11   4
```

Similarly,

```
S    A    M    P    L    E
-1   -1   -1   -1   -1   -1
18   0    12   15   11   4
```
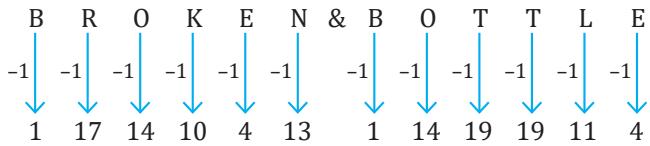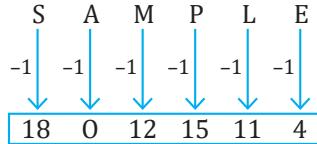
Hence, **1801215114** is the correct answer.

5. (*d*) Here, the logic used is subtraction and addition of alphabet numbers according to English alphabetical series.

RUMMY : QVLNX

R − 1 = Q

U + 1 = V;

M − 1 = L;

M + 1 = N;

Y − 1 = X;

Similarly,

CHESS : ?

C − 1 = B;

H + 1 = I;

E − 1 = D;

S + 1 = T;

S − 1 = R

Hence, BIDTR is the correct answer.

6. (c) The correct option is **(c) 71914**.

In the code language given, the letters are coded as follows:

G-7

A-1

I-9

N-14

So, the code for 'GAIN' is 71914. Here is the detailed explanation:

❖ G = {FIRST LETTER OF GAIN}

❖ A = {SECOND LETTER OF GAIN}

❖ I = [THIRD LETTER OF GAIN}

❖ N = {FOUR LETTER OF GAIN}

Therefore, the code for 'GAIN' is 71914.

7. (a) Here, in the given question we have to find out the code for TIF in the same way as JPG is coded as 19 and PNG is coded as 23.

The logic used is: Sum of place value of first and second letter - place value of third letter = code.

❖ JPG is coded as 19

The place value of J = 10, P = 16, G = 7

= 10 + 16 − 7

= 26 − 7

= 19

❖ PNG is coded as 23

The place value of P = 16, N = 14, G = 7

= 16 + 14 − 7

= 30 − 7

= 23

Similarly,

❖ TIF is coded as:

The place value of T = 20, I = 9, F = 6

= 20 + 9 − 6

= 29 − 6

= 23

So, TIF is coded as 23 in that language.

Hence, 23 is the correct answer.

8. (b) The logic followed here is as follows:

As we know fish live in a water and water is called pot

❖ So the correct answer is Pot.

Hence, option (b) is the correct answer.

9. (a) According to the question:

7	1	12	1	24	18	25
G	A	L	L	A	R	Y

×2 ×2 ×2 ×2 ×2 ×2 ×2

| 14 | 2 | 24 | 24 | 2 | 36 | 50 |

18	1	14	7	5	18
R	A	N	G	E	R

×2 ×2 ×2 ×2 ×2 ×2

| 36 | 2 | 28 | 14 | 10 | 36 |

Hence, 36228141036 is the correct answer.

10. (a) The pattern followed here:

REGULAR is written as GERTRAL.

R E G U L A R

−1

G E R T R A L
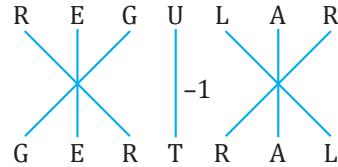
Similarly,

The code for BROTHER will be:

B R O T H E R

−1
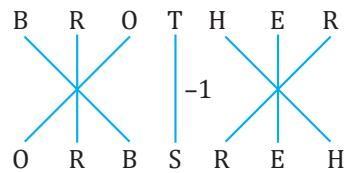
O R B S R E H

Hence, ORBSREH is the correct answer.

11. (d) The logic followed here is:

our son's car = fu da be

son's birthday today = la fu ja

today our match = he da la

The common word in first and second statement is

❖ our **son's** car = **fu** da be

❖ **son's** birthday today = la **fu** ja

'Son's and common code is 'fu'. The common word in second and third statement is

❖ son's birthday **today** = **la** fu ja

❖ **today** our match = he da **la**

'Today' is common word in both statement and common code is 'la' The common word in first and third statement is

❖ **our** son's car = fu **da** be

❖ today **our** match = he **da** la

'Our' is common word in both statement and common code is 'da'

So, remaining word is **car** and its code is **be**, the remaining word is **birthday** and its code is **ja.**

And the remaining word is **match** and its code is **he.**

Words	Code
Son's	fu
Today	la
Our	da
Car	be
Birthday	ja
Match	he

Code for 'car match' = ?

Code for car = be

Code for match = he

Hence, the correct answer is 'he, be'.

12. (c) 4 ③ ⑦ ⑧ ⟶ ① ⓓ O Ⓛ

⑦ ⑧ ③ 2 ⟶ ① ⓓ Ⓛ E

All circles represent letters and numbers that are common to each other but number 2 and letter E is not common in both of equation.

Therefore E will be code for 2.

Hence, **E** is the correct answer.

13. (a) In this question we have to find what will South-West be called as. According to the question:

❖ North is called West,

❖ West is called South

❖ South is called East

So the final direction diagram is as:
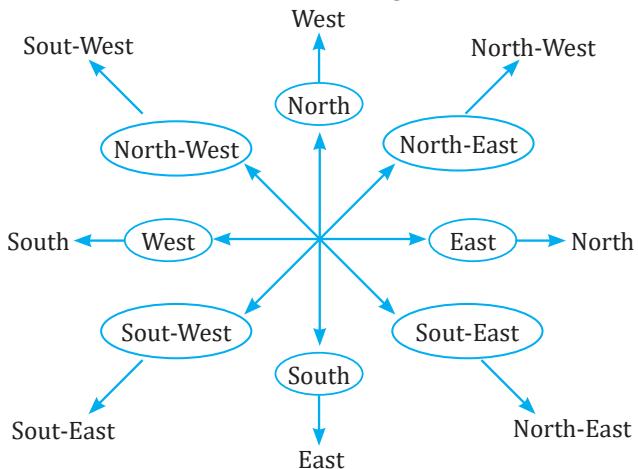
According to the question and the direction diagram the South - west direction be called South - east direction.

Hence, "South - East" is the correct answer.

14. (a) According to the question:

In the given word: ARCHAEOLOGY
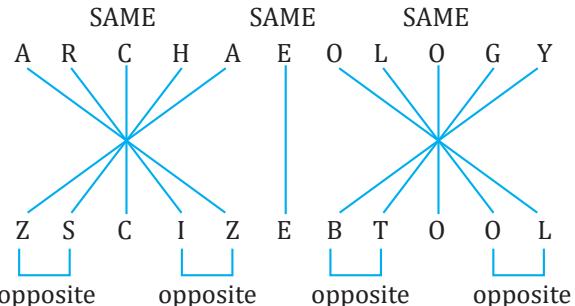
Similarly,
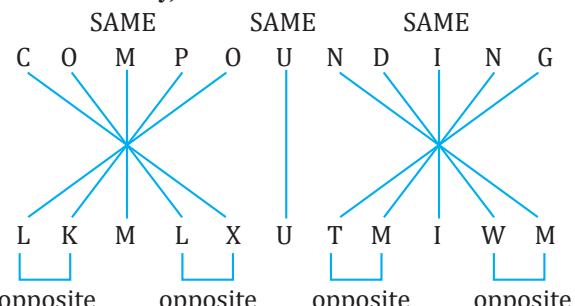
Hence, LKMLXUTMIWN is the correct answer.

15. (c) According to the question:
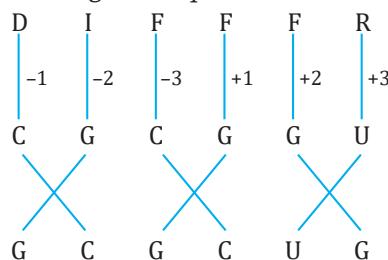


And,
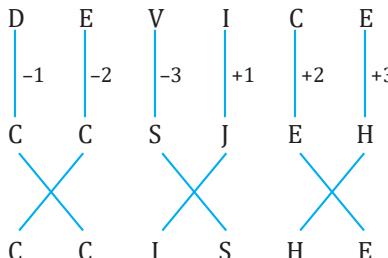
Similarly,
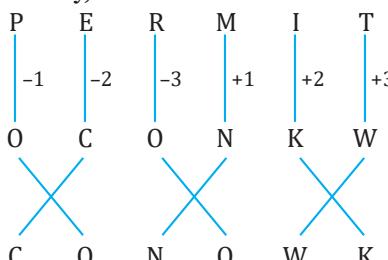
Hence, CONOWK is the correct answer.

❖ ❖ ❖

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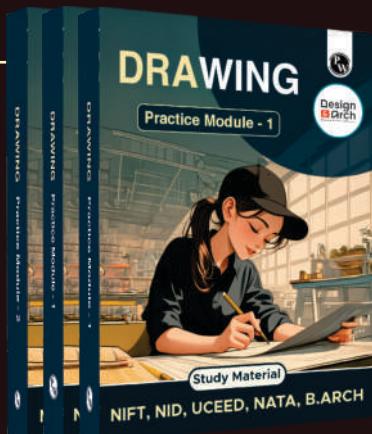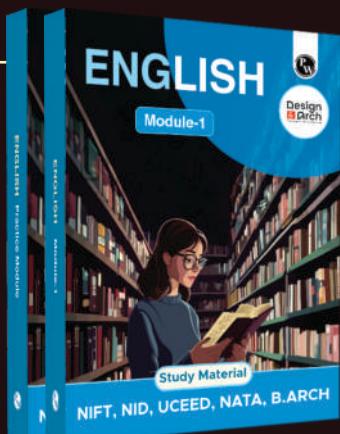
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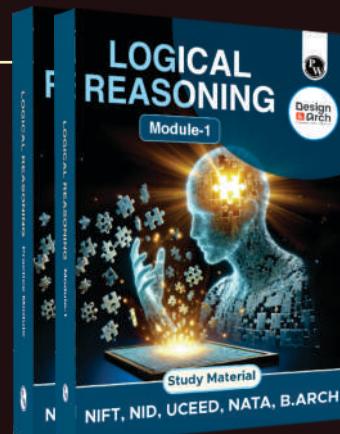
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