



RRB

Section Controller

Railway Recruitment Board (RRB)

Volume - 2

Logical Capability & Mental Reasoning



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CHAPTER

English Alphabet Test



- This chapter includes questions based on the English alphabet (A–Z). Candidates should know the positions of all 26 letters and basic related concepts clearly.
- **Letters are of two types:**
 - ✓ Vowels – A, E, I, O, U (There are 5 vowels in the English alphabet.)

- ✓ Consonants – B, C, D, F, G, H, J, K, L, M, N, P, Q, R, S, T, V, W, X, Y, Z (There are 21 consonants in the English alphabet.)
- **The alphabet is divided into two halves:**
 - ✓ First Half – A to M (The first half contains 13 letters, i.e., positions 1 to 13.)
 - ✓ Second Half – N to Z (The second half contains 13 letters, i.e., positions 14 to 26.)

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
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26

Short trick:

- **EJOTY (इजोटी)**

5	10	15	20	25
E	J	O	T	Y

- **CFILORUX (सिफिलोरक्स)**

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

- **Finding letters from the right side can be simplified using the formula:**

- ✓ Position from left = 27 – Position from right

- **Trick to Remember Opposite Letters**

Pair	AZ	BY	CX	DW	EV	FU	GT
Trick	AZ	BYe	Cracks	DeW	EVening	Few / Uff	G.T. Road

Pair	HS	IR	JQ	KP	LO	MN
Trick	High School	Indian Railway	Jaipur Queen	KanPur	Life OK	MaN

Type-1 Position of a Letter in the English Alphabet

- If counting in the **same direction** (left to left or right to right), **subtract** both positions.
- If counting in **opposite directions** (left to right or right to left), **add** both positions.

Ex: In the English alphabet, what is the 10th letter to the left of the 21st letter from the left?

Ans: Using the trick: If counting in the same direction (left to left or right to right), subtract both positions.

English alphabet = 21-10= 11th alphabet = K

Ex: In the English alphabet, what is the 9th letter to the left of the 11th letter from the right?

Ans: In these types of question first we calculate from the left and then subtract from the 27.

Alphabet = $11 + 9 = 20^{\text{th}}$ from the left

Original alphabet = $27 - 20 = 7^{\text{th}}$ alphabet = G

Type-2 Forming Letter Pairs

- The letter pair can be formed in both forward and backward directions.
- Multiple pairs can be created from a single word.
- After forming a pair with a letter, you can form another pair with the same letter if they are at the same distance according to the English alphabet.

Ex: How many such pairs of letters are there in the word 'COMBINE', each of which has as many letters between them in the word (both forward and backward direction) as they have between them in the English Alphabet?

Ans: First of all, we will write number of positions of 'COMBINE' word according to English alphabet i.e. C is written as 3 and O will be written as 15 and so on.

C	O	M	B	I	N	E
3	15	13	2	9	14	5

Here we can see that only B and E is making one pair.

Type-3 Letter Problems

Ex: If the first and eighth letters of the word 'REPRESENTATIVE' are swapped, then the second and ninth letters, and so on, are also swapped, what will be the fourth letter to the left of the 6th letter from the left in the new arrangement?

Ans:

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Original Letter	R	E	P	R	E	S	E	N	T	A	T	I	V	E
New Letter	N	T	A	T	I	V	E	R	E	P	R	E	S	E

Fourth letter to the left of the 6th letter from the left = $6 - 2 = 4^{\text{th}} = \text{T}$

Type-4 Arrangement of English Words

- Arranging English words in alphabetical or dictionary order is called arrangement of words.

Ex: Arrange the following words according to English dictionary arrangement:

(A) Epitaxy (B) Episode (C) Epigene

(D) Epitome (E) Epilogue

Ans: In a Dictionary, every word is arranged alphabetically. Also, in each word each and every letter is positioned alphabetically. So here, dictionary the arrangement of words in a Dictionary, every word is arranged alphabetically.

(C) Epigene (E) Epilogue (B) Episode

(A) Epitaxy (D) Epitome

Therefore, the correct answer is (C), (E), (B), (A), (D)

Type-5 Meaningful Logical Order of Words

Ex: How many meaningful words of 5 letters can be made with the alphabets K, E, D, H, I each being used only once in each word?

Ans: Given letters: K, E, D, H, I

Meaningful word can be formed out of the alphabets K, E, D, H, I:

HIKED: Walk for a long distance, Hence, only one such word is possible.

Ex: If a five-letter meaningful word can be formed by using the first, third, fifth, sixth and eighth letters from the word "HALLOWEEN", then what is the last letter from the left end of the newly formed word?

Ans: The 1st, 3rd, 5th, 6th, and 8th letters from the left end of the word "HALLOWEEN" are H, L, O, W, and E respectively. The only five-letter meaningful word that can be formed using the letters is WHOLE.



Number and Alphabet Series Test



- A series is a systematic arrangement of numbers or letters within a defined group. In competitive exams, sequences of numbers, letters, or a mix of both are presented. One position in the sequence is either left blank or contains an incorrect number or letter. Candidates are tasked with completing the series by selecting the correct option to fill the blank or identify the incorrect element.

Here's a clearer and concise way to solve number series problems:

- **Look for Patterns:** Check if the numbers are increasing or decreasing by a constant (addition/subtraction) or multiplied/divided by a constant (multiplication/division).
- **Find Differences:**
- ✓ If the difference between consecutive numbers is the same, it's an arithmetic series (e.g., 2, 5, 8, 11).
 - ✓ If the second difference (difference of differences) is constant, it's a quadratic series.
- **Check for Multiplication/Division:** Look if each number is multiplied or divided by a constant to get the next number (e.g., 3, 6, 12, 24 where each number is doubled).
- **Recognize Special Sequences:**
- ✓ **Squares:** 1, 4, 9, 16, ...
 - ✓ **Cubes:** 1, 8, 27, ...
 - ✓ **Fibonacci:** Each number is the sum of the two preceding ones (e.g., 0, 1, 1, 2, 3, 5).
- **Check for Ratios:** If the numbers increase by a constant ratio, it's a geometric progression (e.g., 2, 4, 8, 16).
- **Test the Options:** If options are provided, check which one follows the identified pattern.

Type-1 Series in Increasing Order

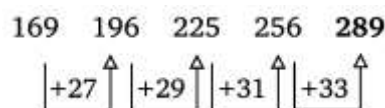
Ex: In the following question, select the missing number from the given series.



169, 196, 225, 256, _?

1. 289 2. 324
3. 441 4. 361

Ans:

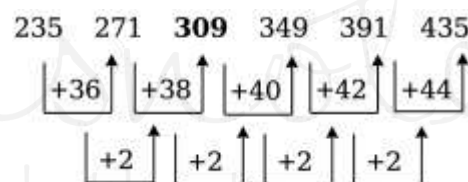


Ex: Which of the following numbers will replace the question mark (?) in the given series?

235, 271, ?, 349, 391, 435

1. 311 2. 307
3. 313 4. 309

Ans:

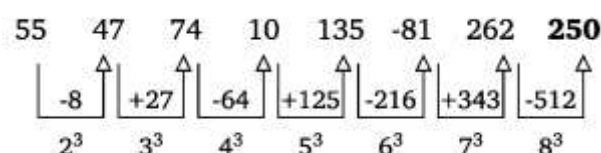


Ex: What number should replace question Mark (?) in the series given below.

55, 47, 74, 10, 135, -81, 262, ?

1. 774 2. -250
3. 343 4. -343

Ans:

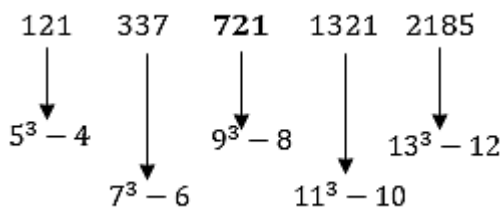


Ex: Find the missing number in the following series:

121, 337, ?, 1321, 2185

1. 713 2. 720
3. 721 4. 737

Ans:



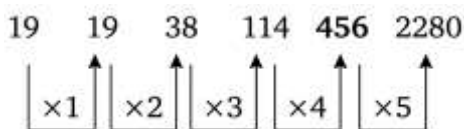
Type-2 Multiplication Based Increasing Series

Ex: Select the number from among the given options that can replace the question mark (?) in the following series.

19, 19, 38, 114, ?, 2280

1. 344 2. 1140
3. 456 4. 224

Ans:

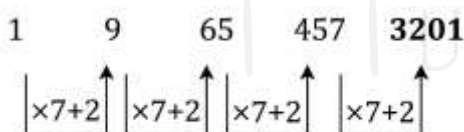


Ex: Which of the following numbers will replace the question mark (?) in the given series?

1, 9, 65, 457, ?

1. 4258 2. 3125
3. 3201 4. 5289

Ans:

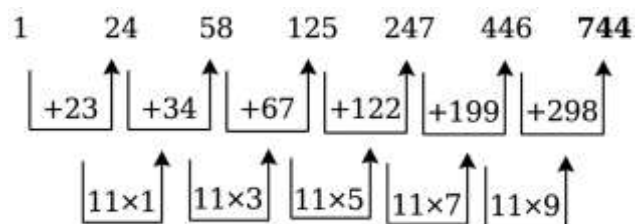


Ex: Which of the following numbers will replace the question mark (?) in the given series?

1, 24, 58, 125, 247, 446, ?

1. 774 2. 747
3. 744 4. 777

Ans:

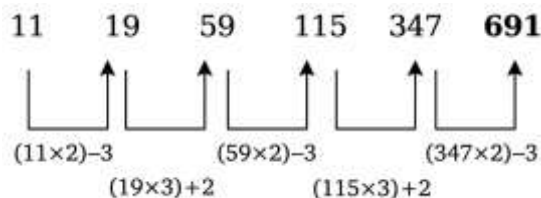


Ex: Select the number from among the given options that can replace the question mark (?) in the following series.

11, 19, 59, 115, 347, ?

1. 697 2. 619
3. 679 4. 691

Ans:



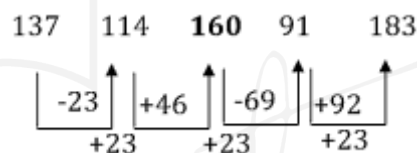
Type-3 Addition and Subtraction Series

Ex: Which of the following number will replace the question mark (?) in the given series?

137, 114, ?, 91, 183

1. 145 2. 160
3. 125 4. 112

Ans:

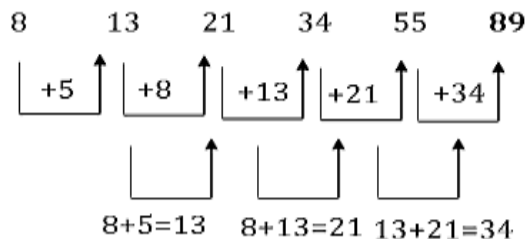


Ex: Which of the following numbers will replace the question mark (?) in the given series?

8, 13, 21, 34, 55, ?

1. 74 2. 68 3. 72 4. 89

Ans:



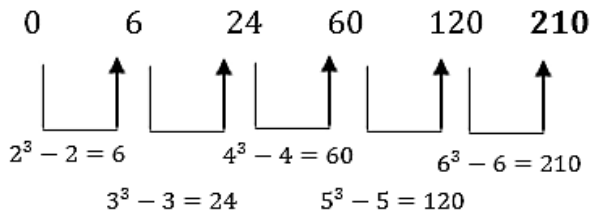
Type-4 Square and Cube Based Series

Ex: Find the next term of the series:

0, 6, 24, 60, 120, ?

1. 180 2. 210
3. 216 4. 240

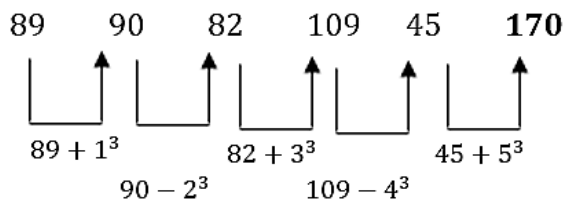
Ans:



Ex: Which number will replace the question mark (?) in the following series?

89, 90, 82, 109, 45, ?

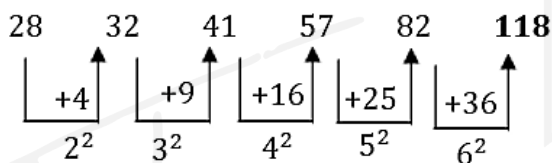
Ans:



Ex: Which number will replace the question mark (?) in the following series?

28, 32, 41, 57, 82, ?

Ans:

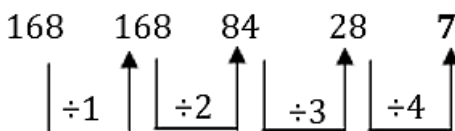


Type-5 Division Based Decreasing Series

Ex: Which number will replace the question mark (?) in the following number series?

168, 168, 84, 28, ?

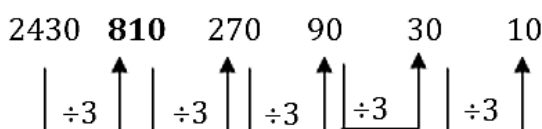
Ans:



Ex: Which number will replace the question mark (?) in the following series?

2430, ?, 270, 90, 30, 10

Ans:



Type-6 Mixed Number Series

Ex: Find the next terms 11, 13, 17, 19, 23, _?

1. 27 2. 29
3. 31 4. 33

Ans:

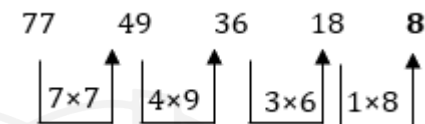
11 → Prime number
13 → Prime number
17 → Prime number
19 → Prime number
23 → Prime number
Next prime number = 29

Ex: What will come in place of the question mark (?) in the following series?

77, 49, 36, 18, ?

1. 10 2. 12
3. 8 4. 16

Ans:

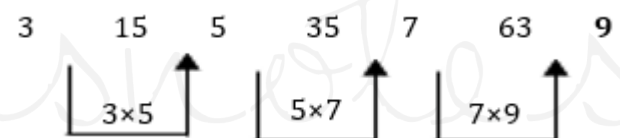


Ex: What will come in place of the question mark (?) in the following series?

3, 15, 5, 35, 7, 63, ?

1. 10 2. 126
3. 9 4. 84

Ans:

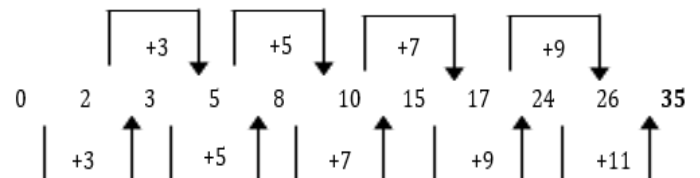


Ex: In the following series, what comes in place of the question mark (?)?

0, 2, 3, 5, 8, 10, 15, 17, 24, 26, ?

1. 28 2. 30
3. 32 4. 35

Ans:



Ex: Select the number from among the given options that can replace the question mark (?) in the following series.

62, 74, 80, 86, 95, ?, 158

1. 113 2. 100
3. 108 4. 122

62 74 80 86 95 113 158

$\uparrow +12$ $\uparrow +6$ $\uparrow +6$ $\uparrow +9$ $\uparrow +18$ $\uparrow +45$

$\uparrow \times 0.5$ $\uparrow \times 1$ $\uparrow \times 1.5$ $\uparrow \times 2$ $\uparrow \times 2.5$

18 37 60 99 120 157

└─+19─┘ └─+23─┘ └─+39─┘ └─+21─┘ └─+37─┘

$$18+19=37 \quad 37+23=60$$

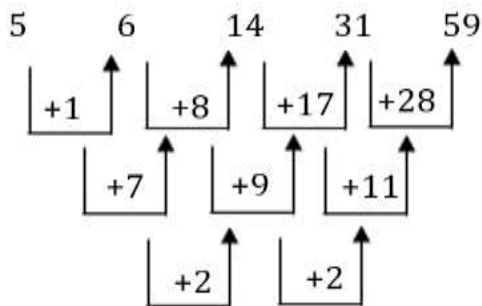
Ex: Find the wrong term from the given number series.

5, 7, 14, 31, 59

1. 31 2.5

3. 59 4.7

Ans: Correct answer in 7



In the place of 6, it is written 7, so the answer is 7.

Ex: Find the Wrong number in the given number series:

6, 7, 10, 13, 21, 37

1. 10 2. 37

3. 6 4. 13

5. 21

Ans:

The given number series follows the pattern:

$$6 + 2^0 = 7 \quad 7 + 2^1 = 10$$

$$10 + 2^2 = 14 \quad 14 + 2^3 = 22$$

$$22 + 2^4 = 38$$

Wrong Number in the given number series is 10.

Type-8 Alphabet Series

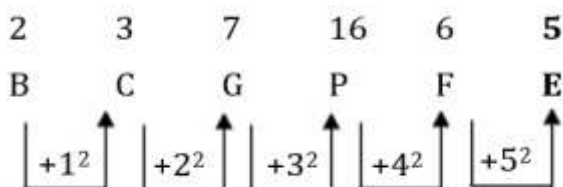
Ex: Which of the following letters will replace the question mark (?) and complete the following letter series?

B, C, G, P, F, ?

1. F 2. E

3. C 4. D

Ans:



Ex: A series is given with one term missing. Select the correct alternative from the given ones that will complete the series.

ABCD, CUKA, ENSX, GGAU, ?

1. IQRT 2. MNOQ

3. IRQT 4. IZIR

Ans:

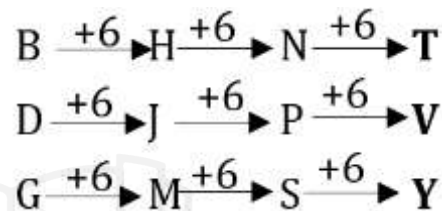
Logic:

- In the first letter, add 2 to its position in the English alphabet.
 - In the second letter, subtract 7 from its position.
 - In the third letter, add 8 to its position.
 - In the fourth letter, subtract 3 from its position.
- Hence, "IZIR" is the correct answer.

Ex: A series is given with one term missing. Select the correct alternative from the given ones that will complete the series.

BDG, HJM, NPS, ?

Ans:



Ex: A series is given, with one term missing. Choose the correct alternative from the given ones that will complete the series.

KIMnO, qRs Tu, WxYzA, cDeFg, ?

1. iJkLm 2. HiJkL

3. IjKIM 4. hijkl

Ans:

The pattern consists of groups of five letters arranged in the English alphabetical order. After each term, one letter is skipped. Additionally, letters follow an alternating pattern of uppercase and lowercase.

After 'g', the next omitted letter is 'h'. Also, the first letter and every alternate letter must be in uppercase.

Hence, the missing term is IjKIM.

Type-9 Mixed Series

Ex: A series is given with one term missing. Select the correct alternative from the given ones that will complete the series.

FK27, LQ64, RW125, ?

1. CX216 2. XB216

3. XC216 4. YB343

Ans:

Letters follow +6 steps in the alphabet

F → L → R → X and K → Q → W → C (after Z it starts from A)

Numbers are cubes of consecutive numbers

27 = 3³, 64 = 4³, 125 = 5³, 216 = 6³

Final answer XC216

Ex: Find the missing term. C4X, F9U, 116R,

1. L25P

2. L250

3. L270

4. L27P

Ans:

First part (letters):

C → F → I → L (each +3)

Second part (numbers):

4 → 9 → 16 → 25 (perfect squares 2², 3², 4², 5²)

Third part (letters):

X → U → R → O (each -3)

So, the missing term is L250

Ex: What will be the next term in the following category?

G7Z26, H8X24, I9V22, _____?

1. J10T20

2. W23J10

3. J10W23

4. W23T20

Ans:

First letter: G → H → I → J (+1 each step)

Number: 7 → 8 → 9 → 10 (+1 each step)

Second letter: Z → X → V → T (-2 each step)

Last number: 26 → 24 → 22 → 20 (-2 each step)

Final answer: J10T20

Type-10 Consecutive Series

In such questions, a sequence of letters and/or numbers is given, formed using uppercase and/or lowercase English alphabets along with numerical values, following a specific pattern from left to right. Certain positions in the sequence are left blank. The task is to identify the correct letters or numbers that should fill these blanks, assuming the pattern continues consistently.

Ex: Select the option that represents the letters that, when sequentially placed from left to right in the blanks below, will complete the letter series.

A _ JL DG LAD J AD _ L

1. DGALGLGJ

2. DGAJGLGJ

3. DAGJGLGL

4. DGALGJGJ

Ans:

Observe carefully:

➤ The series follows a repeating pattern of ADGLJ (with slight shifts).

➤ Letters appear in a cyclic order:

A → D → G → J → L → A...

➤ Fill the blanks to maintain this consistent progression.

Filling accordingly:

A D G J L A D G L L A D G J L A D G J L

So, the missing letters are:

D G A L G J G J

Ex: Which one set of letters when sequentially placed at the gaps in the given letter series shall complete it?

mc_bcm_cbbc_m_bbcm

1. mccb

2. bcmb

3. cbmb

4. Bmmc

Ans:

➤ mccb → mc**m**bcm/c**b**bc**c**/m**b**bbcm

➤ bcmb → mc**b**bcm/c**b**bb**c**m/m**b**bbcm

➤ cbmb → mc**c**bcm/**b**cb**b**c**m**/m**b**bbcm

➤ bmmc → mc**b**bcm/**m**cb**b**c**m**/mc**b**bcm

Hence, 'bmmc' is the correct answer.

Ex: Select the option that represents the letters that, when sequentially placed from left to right in the blanks, will complete the letter series.

g_c_p_c_bc_ps_g_cp_sc

1. bpsppsbp

2. bpcgpsbp

3. bpsgpcbp

4. Bpspgcbp

Ans:

➤ bpsppsbp → g**b**c**p**p**s**c**p**b**c**p**s**s**g**b**c**p**p**s**c**

➤ bpcgpsbp → g**b**c**p**p**c**c**g**b**c**p**p**s**g**b**c**p**p**s**c**

➤ bpsgpcbp → g**b**c**p**p**s**c**g**b**c**p**p**s**c**g**b**c**p**p**s**c

➤ bpspgcbp → g**b**c**p**p**s**c**p**b**c**g**p**s**c**g**b**c**p**p**s**c

Hence, 'bpsgpcbp' is the correct answer.

Ex: Select the option that represents the letters that, when placed from left to right in the same sequence in the blanks below, will complete the letter series.

D _ B _ A _ C _ _ G F _ E _ _ H

1. BACDEFGH

2. CABDHEFG

3. BACDHEFG

4. CABDEFGH

Ans:

D _ B _ A _ C _ _ G F _ E _ _ H

Reverse

Order

Forward

Order

Reverse

Order

Forward

Order

CABDHEFG → DCBA/ABCD/HGFE/EFGH

3

CHAPTER

Analogy Test



- Analogy tests involve identifying similarities between two terms. In this chapter, we explore the relationships between different elements. Such questions are included in exams to evaluate a candidate's knowledge, reasoning, and cognitive abilities.
- Analogy questions are based on specific relationships. To solve these questions effectively, candidates should follow these two steps:

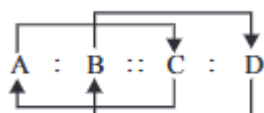
Step 1: Determine the relationship between the first two terms given in the question.

Step 2: Apply the identified relationship to the remaining terms and choose the correct answer.

Rule:1 Basic relationship: In the analogy A: B:: C:D, the relationship between A and B will be the same as the relationship between C and D or D and C.



Rule:2 Developed Relationship: In the analogy A:B:: C:D, the relationship between A and C, or C and A, will be the same as the relationship between B and D, or D and B. It is not necessary that the relationship is directly committed; it may vary.



Type-1 Word Analogy

Common Relationship Patterns

- **Synonym & Antonym:** Famous: Renowned :: Important: Significant (Same); Big: Small :: Sharp: Blunt (Opposite).

- **Tool/Instrument & Action/Function:** Needle: Sew :: Knife: Cut (Instrument-Action).
- **Unit/Part & Whole:** Petal: Flower:: Page: Book.
- **Worker & Tool/Working Place:** Artist: Brush:: Farmer : Plough; Doctor : Hospital :: Teacher : School.
- **Gender/Individual & Group:** Lion: Lioness:: Dog: Bitch.
- **Topic/Category:** Country: Capital (India: New Delhi):: State: Capital (Maharashtra: Mumbai).

Type of Relation	Example
Antonyms/ Synonyms	Believer: Atheist, Import: Export, Victory: Defeat, Living: Non-living
Country and Continent	India: Asia, Ghana: Africa, Canada: North America, France: Europe
Country and Capital	China: Beijing, Nepal: Kathmandu, Japan: Tokyo, Sri Lanka: Colombo
Country and Currency	China: Yuan, Japan: Yen, Italy: Lira, Myanmar: Kyat
Country and Parliament	India: Parliament, Afghanistan: Shora, Iran: Majlis, Japan: Diet
Country and National Symbol	India: Ashoka Chakra, Spain: Eagle, France: Lily, Iran: Rose

Country and National Sport	Britain: Cricket, India: Hockey, Japan: Judo, Spain: Bullfighting
Country and River	India: Ganga, China: Yangtze, Italy: Tiber, Britain: Thames
City and River	London: Thames, Rome: Tiber, Paris: Seine, Delhi: Yamuna
City and Industry	Mumbai: Film Production, Manchester: Cotton, Pittsburgh: Iron and Steel, Detroit: Automobiles
State and Capital	Uttar Pradesh: Lucknow, Uttarakhand: Dehradun, Jharkhand: Ranchi, Chhattisgarh: Raipur
Union Territory and Capital	Lakshadweep: Kavaratti, Dadra and Nagar Haveli: Silvassa
State and High Court	Uttar Pradesh: Allahabad, Uttarakhand: Nainital, Rajasthan: Jodhpur, Bihar: Patna
Product and Raw Material	Curd: Milk, Shoe: Leather, Sugar: Sugarcane, Liquor: Grapes
Worker and Product	Goldsmith: Jewellery, Cobbler: Shoes, Cook: Food, Masons: House
Person and Workplace	Doctor: Hospital, Teacher: School, Farmer: Field, Judge: Court
Person and Tool	Blacksmith: Hammer, Mason: Trowel, Farmer: Plough, Carpenter: Saw

Tool and Work	Pen: Writing, Scissors: Cutting, Spoon: Eating, Glasses: Seeing
Animal and Habitat	Lion: Cave, Horse: Stable, Rat: Hole, Bird: Nest, Bee: Beekeeping, Fish: Fishing
Revolution and Production Area	White Revolution: Milk Yellow Revolution: Oilseed
Animal and Sound	Dog: Barking, Lion: Roaring, Horse: Neighing, Cat: Meowing
Animal and Offspring	Dog: Puppy, Lioness: Cub, Cow: Calf, Sheep: Lamb
Disease and Affected Organ	Pyorrhoea: Teeth, Trachoma: Eyes, Jaundice: Liver, Tuberculosis: Lungs
Location and Place	Taj Mahal: Agra, Hawa Mahal: Jaipur, Jahaz Mahal: Mandu, Red Fort: Delhi
Person and Samadhi Place	Mahatma Gandhi: Raj Ghat, Lal Bahadur Shastri: Vijay Ghat, Chaudhary Charan Singh: Kisan Ghat
Sport and Court	Badminton: Court, Hockey: Field, Boxing: Ring, Shooting: Range
Sport and Cup/Trophy	Cricket: Dilip Trophy, Football: Durand Cup, Hockey: Dhyan Chand Trophy, Golf: Ryder Cup
Award and field	Booker Prize: Literature, Grammy Award: Music, Oscar Award: Film

Instructions: In the following question, select the related number from the given alternatives.

Ex: Car: Road :: Rail : ____.

- (A) Water (B) Air
(C) Road (D) Track

Ans: Just as a car runs on a road, a train (rail) runs on a track.

Ex: Light: Lumen::__?__:__?__

- (A) Temperature: Candela
(B) Density: Kilogram
(C) Pressure: Pascal
(D) Force: Meter

Ans: Lumen is the unit of light, and Pascal is the unit of pressure. Both pairs represent the relationship between a physical quantity and its corresponding unit.

Ex: Person: Biography::__?__:__?__.

- (A) World: Encyclopaedia
(B) Nation: History
(C) Place: Economy
(D) Country: Constitution

Ans: A biography is a written account of a person's life, and history is a written account of a nation's past. Both pairs reflect a relationship between a subject and its written or recorded account.

Ex: Just as 'Taj Mahal' is related to 'Agra', in the same way, 'Lal Bagh' is related to which place?

- (A) Bengaluru (B) Delhi
(C) Haridwar (D) Madhya Pradesh

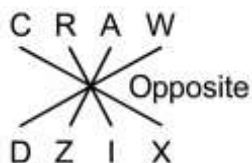
Ans: Just as 'Taj Mahal' is located in Agra, 'Lal Bagh' is located in Bengaluru.

Type-2 Letter Analogy

Ex: Select the option that is related to the third term in the same way as the second term is related to the first term.

CRAW: DZIX:: MOCK:?

Ans: For CRAW: DZIX

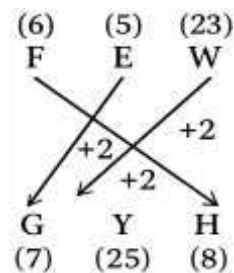


Similarly, for MOCK,

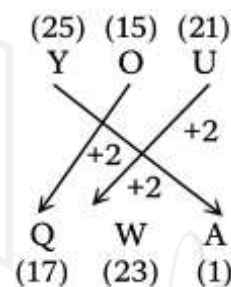


Ex: Select the option that is related to the third letter - cluster in the same way as the second letter -cluster is related to the first letter - cluster. FEW: GYH :: YOU : ?

Ans: For, FEW: GYH

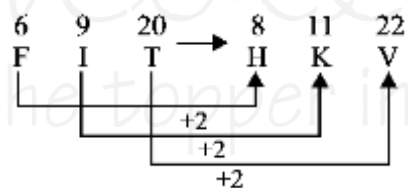


Similarly, YOU:?

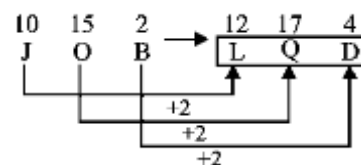


Ex: FIT: HKV:: JOB:?

Ans: logic



Similarly



Ans: JOB: LQD

Type-3 Number Analogy Square



Number	Square	Number	Square
1	1	2	4
3	9	4	16

5	25	6	36
7	49	8	64
9	81	10	100
11	121	12	144
13	169	14	196
15	225	16	256
17	289	18	324
19	361	20	400
21	441	22	484
23	529	24	576
25	625	26	676
27	729	28	784
29	841	30	900
31	961	32	1024
33	1089	34	1156
35	1225	36	1296
37	1369	38	1444
39	1521	40	1600

Cube

Number	Cube	Number	Cube
1	1	2	8
3	27	4	64
5	125	6	216
7	343	8	512
9	729	10	1000
11	1331	12	1728
13	2197	14	2744
15	3375	16	4096
17	4913	18	5832
19	6859	20	8000

Based on square

Ex: 6:36::11: ?

Ans: $6^2=36$, $11^2=121$

Based on cube

Ex: 8:512::10:?

Ans: $8^3=512$, $10^3=1000$

Based on addition

Ex: 389: 392:: 450:?

Ans: $389+3=392$ $450+3=453$

Based on subtraction

Ex: 389:384::450:?

Ans: $389-5=384$ $450-5=445$

Based on multiplication

Ex: 7:56::6:?

Ans: $7 \times 8=56$ $6 \times 8=48$

Based on division

Ex: 35:7::25:?

Ans: $35 \div 7=5$ $25 \div 5=5$

Based on number group

Select the set in which the numbers are related in the same way as are the numbers of the following sets. (NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into its constituent digits. E.g. 13 - Operations on 13 such as adding /subtracting/ multiplying etc. to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed)

Ex: (15, 25, 35) (45, 55, 65)

(1) (55, 65, 75) (2) (45, 55, 70)

(3) (55, 75, 85) (4) (55, 60, 70)

Ans: Logic

$15 \xrightarrow{+10} 25 \xrightarrow{+10} 35$
 $45 \xrightarrow{+10} 55 \xrightarrow{+10} 65$

We check each option.

$$55 \xrightarrow{+10} 65 \xrightarrow{+10} 75$$

The set that relates in the same way as the given sets is Option (1) (55, 65, 75).

Ex: (7, 49, 343) (8, 64, 512)

(1) (6, 36, 206) (2) (5, 25, 225)

(3) (11, 121, 1221) (4) (9, 81, 729)

Ans: Logic

$$(7, 49, 343) = (7, 7^2, 7^3)$$

$$(8, 64, 512) = (8, 8^2, 8^3)$$

(6, 36, 206): 36 is 6^2 , so it's the square of 6: 206 is not 6^3 (which is 216), so this does not follow the pattern.

(5, 25, 225): 25 is 5^2 , so it's the square of 5: 225 is 5^3 , so it's the cube of 5.

(11, 121, 1221): 121 is 11^2 , so it's the square of 11: 1221 is not 11^3 (which is 1331), so this does not follow the pattern.

(9, 81, 729): 81 is 9^2 , so it's the square of 9: 729 is 9^3 , so it's the cube of 9.

Option (4) seems to be the most accurate match in terms of following the same pattern.

Ex: (2, 7, 81) (5, 6, 121)

(1) (7, 5, 134) (2) (5, 4, 100)

(3) (6, 2, 36) (4) (6, 7, 169)

Ans:

$$2+7=9 \quad 9^2=81$$

$$5+6=11 \quad 11^2=121$$

$$7+5=12 \quad 12^2=144 \neq 134$$

$$5+4=9 \quad 9^2=81 \neq 100$$

$$6+2=8 \quad 8^2=64 \neq 36$$

$$6+7=13 \quad 13^2=169=169$$

Type- 4 Letter-Number Analogy

➤ In these types of questions, there is a relationship between English letters and numbers. This relationship can exist in the form of corresponding numbers for the English letters or in other forms.

Ex: Instructions: On the left side of the symbol, a letter/letter pair and numbers are given, and on the right side, a letter/letter pair and a question mark (?) are provided. You need to identify which number from the given options on the right side maintains the same relationship with the right-side letter/letter pair as the left-side letter/letter pair and number.

Ex: Vijay: 05 :: Shubham:?

Ans:

Number of alphabets in 'Vijay' = 5

So, from this logic

Number of alphabets in 'Shubham' = 7

Ex: Select the option that is related to the fifth letter-number cluster in the same way as the second letter-number cluster is related to the first letter-number cluster and fourth letter-number cluster is related to third letter-number cluster.

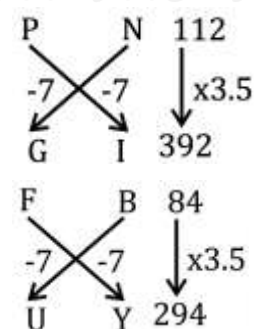
(NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into its constituent digits. E.g. 13 Operations on 13 such as adding / subtracting / multiplying etc. to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed)

PN112: G1392 :: FB84: UY294 :: AR56:?

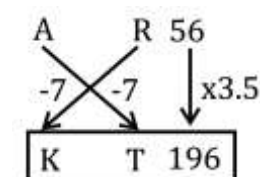
1. KT204 2. KT196

3. LS204 4. LS196

Ans:



Similarly,



The correct answer is option 2.

4

CHAPTER

Arrangement and Pattern (Alphabet & Number Series)

Introduction of Alphabet

- This chapter includes questions based on the English alphabet (A – Z). Candidates should know the positions of all 26 letters and basic related concepts clearly.
- **Letters are of two types:**
 - ✓ **Vowels** – A, E, I, O, U (There are 5 vowels in the English alphabet.)

- ✓ **Consonants** – B, C, D, F, G, H, J, K, L, M, N, P, Q, R, S, T, V, W, X, Y, Z (There are 21 consonants in the English alphabet.)
- **The alphabet is divided into two halves:**
 - ✓ **First Half** – A to M (The first half contains 13 letters, i.e., positions 1 to 13.)
 - ✓ **Second Half** – N to Z (The second half contains 13 letters, i.e., positions 14 to 26.)

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
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26

Short trick:

- **EJOTY** (इजोटी)

5	10	15	20	25
E	J	O	T	Y

- **CFILORUX** (सिफिलोरक्स)

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

- **Finding letters from the right side can be simplified using the formula:**

- ✓ Position from left = 27 – Position from right

- **Trick to Remember Opposite Letters**

Pair	AZ	BY	CX	DW	EV	FU	GT
Trick	AZ	BYe	Cracks	DeW	EVening	Few / Uff	G.T. Road

Pair	HS	IR	JQ	KP	LO	MN
Trick	High School	Indian Railway	Jaipur Queen	KanPur	Life OK	MaN

Points to Remember

'A' Preceded by 'B'	→ BA
'A' Followed by 'B'	→ AB
'A' Precedes 'B'	→ AB
'A' Follows 'B'	→ BA

Vowel	→ A, E, I, O, U
-------	-----------------

Consonant	→ B, C, D, F, G, H, J, K, L, M, N, P, Q, R, S, T, V, W, X, Y, Z.
-----------	--

Prime Numbers	→ A number which is not divisible by any number except 1. Example: 2, 3, 5, 7, 11, 13, 17, 19, 23, etc.
---------------	--

Even Numbers	→ A number which is divisible by 2. Example: 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, etc.
--------------	---

Odd Numbers	→ A number which is not divisible by 2. Example: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, etc.
-------------	---

Type 1: Dictionary or Alphabet Based

Ex: In the given word "AUTHORISE" replace the consonants with the succeeding letter as per the English alphabet series and vowel with their preceding letter as per the English alphabet series. Then arrange the letters in reverse alphabetical order from right to left. Which of the following letter is third from the left end after arrangement?

Sol:

- ✓ **According to Questions:**

- Vowel → Previous letter
- Consonant → Next letter
- "Reverse alphabetical from right to left" Same as A → Z from left

✓ **Apply this Rule:**

AUTHORISE

A U T H O R I S E

↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓

Z T U I N S H T D

✓ **New word:** Z T U I N S H T D

✓ **Arrange (A → Z from left)**

D H I N S T T U Z

✓ **Answer** → 3rd from left = I

Exam Tip

For phrase “reverse alphabetical order from right to left”, arrange Z to A starting from the right side. So, from the left side, it appears as A to Z.

Ex: Read the following information carefully and answer the given questions: If it is possible to make a meaningful four-letter English word from the third, fifth, sixth, and eighth from the left end of the word "DIABETES", then which of the following will be the second letter of that word from the right end? If more than one such word can be made then give 'Z' as the answer and if no such word can be formed then give 'X' as the answer.

Sol:

✓ **Trick:** Find positions → Pick letters → Make words

✓ **Rule:**

- **Only 1 word** → answer the asked letter
- **More than 1 word** → answer Z
- **No word** → answer X

✓ **Word:** DIABETES

D	I	A	B	E	T	E	S
1	2	3	4	5	6	7	8
		↑		↑	↑		↑
		A		E	T		S

✓ **Possible meaningful words:** EATS, SEAT, EAST, TEAS, SATE

✓ More than one word can be formed.

Exam Tips

Do not stop after finding one word. Check whether **more than one meaningful word** can be made.

Ex: In the following question, five different words are given in the options. Along with each word, positions of four letters in that word are given and the positions of the letters are counted from the left end of the word. Four lettered meaningful word can be formed from the letters corresponding to the positions given in each option without jumbling the letters. Which of the following options will give a meaningful English word?

(A) Claustrophobia - 2, 7, 12, 14

(B) Photosynthesis - 2, 7, 8, 12

(C) Incomprehensive - 3, 4, 10, 12

(D) Notwithstanding - 4, 5, 11, 12

(E) Parallelogram - 6, 7, 12, 13

Sol:

✓ **Trick:** Count positions → Pick letters → Do not jumble → Check word

✓ Meaningful word must be formed **in the same order**.

PICTORIAL SOLUTION

Pick the letters at given positions (from left end) without jumbling and form a 4-letter meaningful word.

(A) Claustrophobia
2, 7, 12, 14

C	L	A	U	S	T	R	O	P	H	O	B	I	A
1	2	3	4	5	6	7	8	9	10	11	12	13	14
	↓					↓					↓		↓
	L					R					B		A
L R B A													

✗

(B) Photosynthesis
2, 7, 8, 12

P	H	O	T	O	S	Y	N	T	H	E	S	I	S
1	2	3	4	5	6	7	8	9	10	11	12	13	14
	↓					↓	↓				↓		
	H					Y	N				S		
H Y N S													

✗

(C) Incomprehensive
3, 4, 10, 12

I	N	C	O	M	P	R	E	H	E	N	S	I	V	E
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		↓	↓						↓		↓			
		C	O						E		S			
C O E S														

✗

(D) Notwithstanding
4, 5, 11, 12

N	O	T	W	I	T	H	S	T	A	N	D	I	N	G
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
			↓	↓							↓	↓		
			W	I							N	D		
W I N D														

✓

(E) Parallelogram
6, 7, 12, 13

P	A	R	A	L	L	E	L	O	G	R	A	M
1	2	3	4	5	6	7	8	9	10	11	12	13
					↓	↓					↓	↓
					L	E					A	M
L E A M												

✗

ONLY OPTION (D) FORMS A MEANINGFUL WORD.

ANSWER: (D) NOTWITHSTANDING → WIND

Ex: There are four words given in each option that follows a certain logic, if the second letter from the left of each word is taken then a meaningful word can be formed, find the odd one which does not follow the same pattern.

Sol:

- ✓ **Trick:** Take the **2nd letter from the left** of each word.
- ✓ If those 4 letters form a meaningful word → it follows the pattern.
- ✓ The option that does **not** form a meaningful word is the **odd one**.
- ✓ **Second letter from left from each word is**
 - **In option-1-** P, I, A, R → Meaningful word is PAIR.
 - **In option-2-** T, P, E, S → Meaningful word is PEST.
 - **In option-3-** B, D, I, R → Meaningful word is BIRD.
 - **In option-4-** R, T, U, H → Meaningful word is HURT.
 - **In option-5-** X, B, H, Y → No meaningful word.

Hence, option-5 is odd.

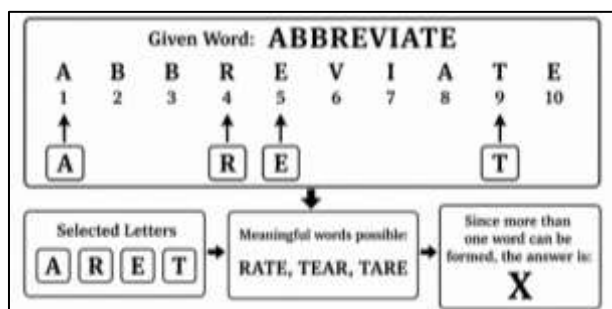
Exam Tips

Second letters only → Make 4 - letter word →
Odd option = no meaningful word

Ex: If it is possible to make only one 4 letters meaningful word without repetition from the first, fourth, fifth, and the ninth letters of the word 'ABBREVIATE', which would be the second letter of the word? If more than one such word can be formed, give X as the answer. If no such word can be formed, give K as your answer.

Sol:

- ✓ **Trick:** Pick letters → Make 4-letter word → Check count



Exam Tips

Only 1 word → 2nd letter
More than 1 → X
No word → K

Type 2: Random Sequence of Alphabets

Ex:

Direction: Following questions are based on five words given below: **TSR FKL FGO VQE HDB**

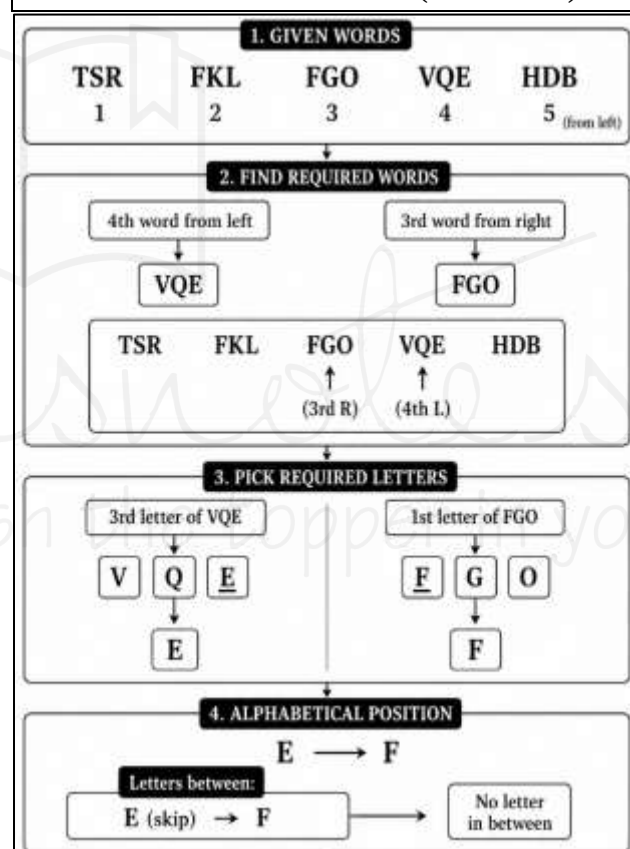
(The new words formed after performing the mentioned operations may or may not necessarily be meaningful English words)

How many letters are there in between the third letter of the fourth word from the left end and first letter of the third word from the right end as per the alphabetical series?

Sol:

Trick: Always break the question into 3 parts

1. Identify word position
2. Pick required letters
3. Count letters between them (A–Z series)



Ex: If all the letters of the word "FRONTIER" are arranged in alphabetical order starting from the left end, then how many letters are there in English alphabets between the letters which are fifth from the right end and fourth to the left of the seventh letter from the left end?

Sol:

Trick:

1. Arrange letters in A → Z
2. Identify positions carefully
3. Convert both letters to alphabetical positions
4. Count letters BETWEEN (not including ends)

Given Word - FRONTIER

If all the letters of the word "FRONTIER" are arranged in alphabetical order starting from the left end, then we get → EFINORRT

N is **fifth from the right** end and **I** is **fourth to the left of the seventh letter** from the **left end** that is **R**.

There are **four letters between I and N** in alphabetical order. (J, K, L and M)

Hence, the correct answer is Four.

Ex: If it is possible to make only one seven letter meaningful English word with the 1st, 4th, 5th, and 7th letter of the word PRIORITY and 3rd, 5th, and 6th letter of the word SECTOR, which of the following will be the first letter from left of that word? If no such word can be made give 'X' as the answer and if more than one such word can be made give 'Y' as the answer.

Sol:

1. GIVEN WORDS								
PRIORITY	1	2	3	4	5	6	7	8
	P	R	I	O	R	I	T	Y
SECTOR	1	2	3	4	5	6		
	S	E	C	T	O	R		

2. PICK THE REQUIRED LETTERS						
From PRIORITY (1st, 4th, 5th, 7th)			From SECTOR (3rd, 5th, 6th)			
1	4	5	7			
↓	↓	↓	↓			
P	O	R	T	C	O	R

3. COMBINE ALL SELECTED LETTERS						
P	O	R	T	C	O	R

4. FORM POSSIBLE 7-LETTER WORD(S)
PORTCOR (Only one meaningful English word can be formed.)

5. CHECK THE NUMBER OF WORDS
Only one meaningful word can be formed.

6. APPLY THE RULE
Only one word → Answer is the first letter from left of that word,

7. FINAL ANSWER
P

Type 3: General Series of Alphabets

Ex:

Direction: Study the following series carefully and answer the question given below.

M F J O L Q W E R T Y U P A H D G I N X Z C V B S K

How many vowels are there in the given series which is immediately followed by a letter which comes after 'M' in alphabetical series?

Sol:

Given series: M F J O L Q W E R T Y U P A H D G I N X Z C V B S K

Vowels which is immediately followed by a letter which comes after 'M' in alphabetical series

M F J O L Q W E R T Y U P A H D G I N X Z C V B S K

Hence there are 'three' vowels which are immediately followed by a letter which comes after 'M' in alphabetical series.

Ex:

Direction: Read the following information carefully and answer the given questions below;

G M Z P Q R S U T A B I J K O N S P C E D F A H L G I M S V P O

How many elements are there between the 15th element from the left end and 23rd element from the right end?

Sol:

Series: G M Z P Q R S U T A B I J K O N S P C E D F A H L G I M S V P O

15th element from the left end is O and 23rd element from the right end is A.

G M Z P Q R S U T A B I J K O N S P C E D F A H L G I M S V P O

There are only 4 elements between the 15th element from the left end and 23rd element from the right end.

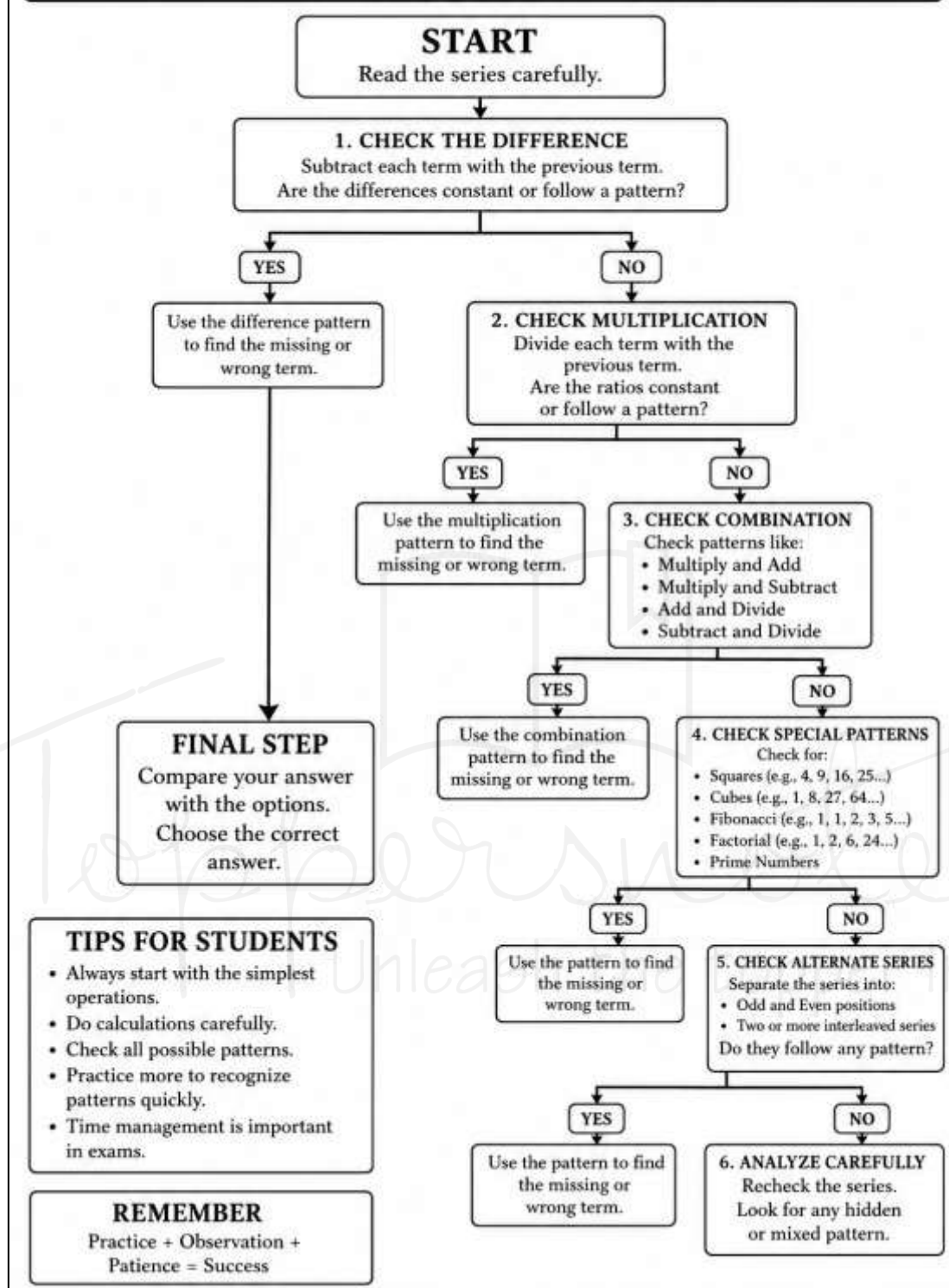
Hence, the answer is Four.

Introduction of Number Series

A series is a systematic arrangement of numbers or letters within a defined group. In competitive exams, sequences of numbers, letters, or a mix of both are presented. One position in the sequence is either left blank or contains an incorrect number or letter. Candidates are tasked with completing the series by selecting the correct option to fill the blank or identify the incorrect element.

NUMBER SERIES FLOWCHART

A Step-by-Step Guide for Students



Here's a clearer and concise way to solve number series problems:

- **Look for Patterns:** Check if the numbers are increasing or decreasing by a constant (addition/subtraction) or multiplied/divided by a constant (multiplication/division).

➤ **Find Differences:**

- ✓ If the difference between consecutive numbers is the same, it's an arithmetic series (e.g., 2, 5, 8, 11).
- ✓ If the second difference (difference of differences) is constant, it's a quadratic series.