Coding – Decoding

Learning Objectives

- What is Coding Decoding
- Types of Problems

What is Coding - Decoding

A 'code' is a system of conveying a message through signals. It is method of sending a message between sender and the receiver in such a way that only the sender and the receiver can know its meaning. However 'Coding' is done according to a certain pattern in the mind of the sender Therefore, Its meaning can be deciphered by a third person, only if he carefully studies this pattern. This process is called 'Decoding'. This capability is important in many fields of application.

Generally, letters are coded into numbers according to their position in alphabetical order in backward or forward sequence. The position of letters are shown, in the tables given below:

А	В	С	D	Е	F	G	Н	Ι	J	Κ	L	М
1	2	3	4	5	6	7	8	9	10	11	12	13
Ν	0	Р	Q	R	S	Т	U	V	W	Х	Y	Ζ
14	15	16	17	18	19	20	21	22	23	24	25	26

Positions of letters in forward order (Left to Right)

Table 1

Positions of letters in a backward order (Right to Left)

Ζ	Y	Х	W	V	U	Т	S	R	Q	Р	0	Ν
1	2	3	4	5	6	7	8	9	10	11	12	13
М	L	Κ	J	Ι	Н	G	F	Е	D	С	В	А
14	15	16	17	18	19	20	21	22	23	24	25	26

Table 2

Types of Problems

Various types of problems can be asked on coding-decoding.

Coding-Decoding in Forward Sequence

In such problems, letters are coded in forward alphabetical sequence.

Example

If 'DEF' is coded as 'GHI', then 'LMN' will definitely be coded as 'OPQ'

Explanation: In this case, letters of the word **'DEF'** shift three places forward in alphabetical sequence as shown below:

 $\begin{array}{ccccc}
D & E & F \\
4 & 5 & 6 \\
+3 & +3 & +3 \\
7 & 8 & 9 \\
G & H & I
\end{array}$

Similarly, by shifting the letters of 'LMN' three places forward in alphabetical order, the code obtained for 'LMN' is 'OPQ' as shown below:

Example

If 'GOT' is coded as 'IQV', then 'TOP' will definitely be coded as 'VQR'.

Explanation: In this case, letters of the word **'GOT'** shift two places forward in alphabetic sequence as shown below:

G O T 7 15 20 +2 +2 +2 9 17 22 I Q V

Similarly, by moving the letters of the word 'TOP' two places forward, the word 'VQR' is obtained.

Т	0	Ρ
20	15	16
+2+	2 -	-2
\downarrow	\downarrow	.↑
22	17	18
V	Q	R

Commonly Asked Questions

If 'LMN' is coded as 'OPQ' in a certain language, then find the code for 'PQR'.

(a) STU	(b) UTS
(c) TUS	(d) UST

(e) None of these

Ans.

(a)

Explanation: Option (a) is correct because in this case letters of the word **'LMN'** are moved three places forward as shown below:

By following the similar pattern, we get

So, the code for 'PQR' is 'STU'

If 'WO' is coded as 'YQ', then 'NE' will be coded as:

(a) WE	(b) PG
(c) YP	(d) GP
(e) None of these	

Ans. (b)

Explanation: in this question, each letter of **'WO'** moves forward by two steps shown below:

Code for 'WO': $\begin{array}{c|c} W & O \\ 23 & 15 \\ \hline \\ Code for 'WO': +2 \\ +2 \\ +2 \\ 7 \\ 25 \\ Y \\ Q \end{array}$

On applying the same pattern for the word 'NE', we get

Code for 'NE': $+2 \begin{vmatrix} +2 \\ +2 \end{vmatrix}$ $+2 \begin{vmatrix} +2 \end{vmatrix}$ $+2 \end{vmatrix}$

So, the code for 'NE' is 'PG'. Thus, option (b) is the correct choice.

Coding-Decoding in Backward Sequence

In such problems, letters are coded in backward alphabetical sequence.

Example

(a)

If 'ROSE' is coded as 'PMQC' then 'NOSE' will definitely be coded as:

(a) LMQC	(b) LCQM
(d) MLQC	(d) QLMC
(e) None of these	

Ans.

Explanation: In this question, letters of 'ROSE' are coded two places backward as shown below in the figure:

 $\begin{array}{c|ccccc} R & O & S & E \\ 18 & 15 & 19 & 5 \\ \hline -2 & -2 & -2 & -2 \\ \downarrow & -2 & -2 & -2 \\$

In the same manner, letters of 'NOSE' are also coded two places backward.

N	0	S	Е
14	15	19	5
-2 -	2 -	2 -	2
\checkmark	\checkmark	\checkmark	↓
12	13	17	3
L	Μ	Q	С

Thus, the code for 'NOSE' is 'LMQC'.

In a certain language TAP is coded as SZO, then FREEZE will be coded as:

(a) EQDFYG	(b) ESDFYF
(d) GQFDYF	(d) EQDDYD
(e) None of these	
(d)	

Ans.

Explanation: In this question, each letter of the word **'TAP'** is moving one step backward.

 $T \xrightarrow{-1} S; A \xrightarrow{-1} Z; P \xrightarrow{-1} O$

Keeping in mind this rule FREEZE will be written as F - 1 = E, R - 1 = Q, E - 1 = D E - 1 = D, Z - 1 = Y and E - 1 = D. 1 = D, or to say FREEZE will be written as EQDDYD. Thus option (d) is .correct answer.

Commonly Asked Question

If code for 'SOD' is 'QMB', then what will be the code for 'GHP'?

(a) MQN	(b) FGN
(c) FEN	(d) EFN

(c) FEN	(d
()	`

(e) None of these

Ans. (d)

Explanation: In this question, each letter of the word **'SOD'** moved two steps backward as shown below:

Code for 'SOD':

$$S O D$$

 $1915 4$
 $-2 | -2 | -2 |$
 $17 13 2$
Q M B

By following the similar pattern, the code for 'GHP' is 'EFN' as shown in the diagram given below:

$$\begin{array}{c} G H P \\ 7 8 16 \\ \hline \\ \text{Code for 'GHP':} & \begin{array}{c} -2 & | -2 \\ \hline & 2 & | -2 \\ \hline & 4 & 0 \\ \hline & 5 & 6 & 14 \\ \hline & E & F & N \end{array}$$

Thus, option (d) is the correct choice.

If 'ZDIE' is coded as 'YCHD', then 'NETL' will be coded as:

(a) MDSK	(b) TENK
(c) UFOK	(d) SDMK
(e) None of these	

Ans. (a)

Explanation: In this case, each letter of the word '**ZDIE**' moved one step backward.

By following the similar pattern, the code for 'NETL' is

Code for 'NETL':
$$-1 \begin{vmatrix} -1 \\ -1 \\ -1 \end{vmatrix} -1 \end{vmatrix} -1 \begin{vmatrix} -1 \\ -1 \\ -1 \\ -1 \end{vmatrix} -1 \end{vmatrix}$$

13 4 19 11
M D S K

So, the code for 'NETL' is 'MDSK'. Thus, option (a) is the correct choice.

Coding-Decoding in Forward-Backward Sequence

In such pattern, letters are coded backward and forward order/forward and backward order alternately.

Example

If 'NAME' is coded as 'MBLF', then 'GAME' will definitely be coded as:

(a) EBMG	(b) FBLF
(c) ECNF	(d) FCLG
(e) None of these	
(b)	

Ans.

Explanation: in this question, letters of '**NAME**' are moved one place backward and one place forward alternately as shown below:

N	А	Μ	Ε
14	1	13	5
-1 +	1 -	1 +	1
13	ž	12	6
Μ	В	L	F

By applying the same rule/ code for the word 'GAME' is 'FBLF' as shown below.

G	А	Μ	Ε
7	1	13	5
-1 +	1 -	1 +	1
\checkmark	\checkmark	\checkmark	↓
6	2	12	6
F	В	L	F

So, option (b) is correct answer.

If in a certain code, SIKKIM is written as THUJL, then how is TRAINING written in that code?

(a) SQBHOHOH	(b) UQBHOHOF
(c) UQBJOHHO	(d) UQBJOHOH
(e) None of these	

Ans. (b)

Explanation: The letters in the SIKKIM are moving alternately one step forward and one step backward.

$$\int_{T}^{S} \left(1 - 1 \right) \int_{L}^{T} \left(-1 \right) \int_{L}^{K} \left(+1 \right) \int_{J}^{L} \left(-1 \right) \int_{L}^{L} \left(+1 \right) \int_{L}^{M} \left(-1 \right) \int_{L}^{$$

By applying the same rule, we get

So, option (b) is correct answer.

Commonly Asked Questions

If 'EFNE' is coded as 'CHLG', then 'LTNE' will be coded as:

(a) TLLG	(b) UMLG
(c) JVLG	(d) VJ LG
(e) None of these	

Ans. (c)

Explanation: Each letter of the word **'EFNE'** is moving two places backward and forward alternatively as shown below:

So, by following the similar pattern, the code obtained for 'LTNE' is as follows:

So, the code for 'LTNE' is 'JVLG'. Thus, option (c) is the correct.

In a certain coding language, the word 'SHOWR' is coded as 'TGPVS'. How will 'MINER' be coded in that language?

(a) OHODS	(b) DOHOS
(c) HOODS	(d) DOOHS
(e) None of these	
(a)	

Ans.

Explanation: In the mentioned coding language, each letter of the word **'SHOWR'** has moved 1 place forward and one place backward alternately as shown in the figure given below:

So, by following the same pattern, the code obtained for 'MINER' is as follows:

	N		N	E	R
	14	9	14	5	18
Code for 'NINER':	+1 - ↓ 15 0	1 + 8 H	·1↓ -: 15 0	1↓+ 4 D	-1 19 S

So, the code for 'NINER' is 'OHODS'. Thus, option (a) is the correct.

Coding-Decoding by Reversing Letters

In such problems, the 1^{st} letter from right takes the 1^{st} place from left, the 2^{nd} letter from right takes the 2^{nd} position from left, the 3^{rd} letter from right takes the 3^{rd} place from left and the process goes on till all the letters get arranged in this manner.

Example

If 'ABCDE' is coded as 'EDCBA', then 'TGPMG' will definitely be coded as 'GMPGT'. Explanation: 'ABCDE' is coded in reverse order as 'EDCBA'

Similarly, **'TGPMG'** will be coded by writing the letters in reverse order. Therefore, the code for **'TGPMG'** will be **'GMPGT'**.

Example

KINDA' is coded as **'ADNIIC** then **'MINDL'** will definitely be coded as **'LDNIM'**. **Explanation: KINDA'** is coded in reverse order as **'ADNIK'**. In the same way, the code for **'MINDL'** has been obtained by writing it in reverse order as **'LDNIM'**.

Commonly Asked Questions

If 'NSCAIR' is coded as 'RIACSIST, then the code for 'CREATE' will be:

(a) AETERC	(b) ETAERC
(c) ETAECR	(d) TEAERC

(e) None of these

Ans. (b)

Explanation: Option (b) is correct because coding has been done by writing the letters of words in reverse order.

If 'NOTA' is coded as 'ATON', then 'ROAST' will be coded as.....

(a) TSARO	(b) STAOR
(c) TSOAR	(d) TSAOR
(e) None of these	
(d)	

Ans.

Explanation: Option (d) is correct because here, the letters of given word '**NOTA**' have been coded by writing them in reverse order. Following the same pattern, the code for '**ROAST**' will be '**TSAOR**'.

If 'POTI' is coded as 'ITOP', then 'LCAT' is coded as:

(a) ACTL	(b) CTAI
(c) ATCL	(d) TACI
(e) None of these	

Ans. (d)

Explanation: Option (d) is correct because here **'POTI'** gets reversed as **'ITOP'** Similarly, letters of **'LCAT'** will get reversed as **'TACL'**.

Coding-Decoding Based on Numbers and Letters

In such problems, numerical code values are given to words and letter code values are given to numbers.

Example

If in a certain code language, 'A' is coded as '2', 'B' is coded as '3', 'C' is coded as '4^s and so on, then code for 'AECBGH' will definitely be '264389'.

Explanation: In this case, letters are coded as shown below:

A	В	C	D	E	F		
2	3	4	5	6	7		

Now, by following the similar pattern, we get

A	Е	С	В	G	Н	
2	6	4	3	8	9	

Thus, the code for 'AECBGH' is '264389'.

Example

In a certain code, '3' is coded as 'P', '4' is coded as 'R', '5' is coded as 'D', '6' is coded as 'T' then the code for '3553643' will definitely be 'PDDPTRP'.

Explanation: Here, alphabetical code values are given for numbers. Therefore, the code for numbers will be as following:

Clearly, the code for '3553643' is 'PDDPTRP'.

Just see the following letter codes and find the code for 'TRGPNZ'.

	Α	Ρ	Т	G	R	N	Z		
	5	6	9	1	2	8	7		
,		001	<u> </u>	7				4. 450167	
(a) !	921	68	/				(b) 453167	
(c) (512	527	7				(d) 126874	
(e)]	Nor	ne o	f the	ese				
(a)								

Т	R	G	Ρ	Ν	Ζ
9	2	1	6	8	7

Explanation: According to the given information,

So, the code for **'TRGPNZ'** is **'921687'**. Thus, option (a) is the correct choice.

In a certain code language '2' is coded as 'L' '4' is coded as 'D', '6' is coded as 'W', '5' is coded as 'N'. Then how will 'LWNNDL be coded?

- (a) 625542 (b) 545265
- (c) 526542 (d) 265542
- (e) None of these

Ans. (d)

Ans.

L	W	Ν	Ν	D	L	
2	6	5	5	4	2	

Explanation: According to the given information,

So, the code for **'LWNNDL'** is **'265542'**. Thus, option (d) is the correct choice.

Coding-Decoding Based on Letter Positions in Alphabet

In such problems, letters are coded on the basis of forward/backward alphabet sequence.

Example

If 'AGB' coded as '10', then 'DEE' will definitely be coded as '14'

Explanation: The given code is the addition of the positions of letters in forward alphabetical sequence.

By following the same rule, the code for 'DEE' is 14 as shown below:



Example

If 'B' is coded as '25', then 'D' will definitely be coded as '23'.

Explanation: Here, letters have been coded according to their positions in backward alphabetical order. In backward alphabetical order 'B' has '25' position, in the same way 'D' has '23rd' position.

If 'HI' is coded as '1', then find the code for 'DH'.

(a) 4	(b) 18
(c) 8	(d) 10
(e) None of these	

Ans.

Explanation: Option (a) is correct because the given code of **'HI'** is the difference in the positions of **'H'** and T in backward alphabetical sequence.

Let us see:

(a)

Code for 'HI': 19 - 18 = 1

In the same manner, **'DH'** will be coded as shown below:

Code for 'DH': 23 - 19 = 4

So, the code for 'DH' is '4'. Thus option (A) is the correct choice.

If code for 'FAG' is '617', then code for 'CEA':

(a) 351	(b) 361
(c) 135	(d) 316

(e) None of these

Ans.

(a)

Explanation: Option (A) is correct because '**F**', '**A**' and '**G**' have been replaced by their positions in forward alphabetical sequence.

Code for 'FAG': F A G 6 1 7

'CEA' will be coded in the same way.
Code for 'CEA': C E A 3 5 1
So, the code for 'CEA' is 351. Thus, option (a) is the correct choice.

Coding-Decoding Based on Words in a Chain

In such problems, more than one word make a sequence so that 1^{st} word is the code of 2^{nd} , 2^{nd} word is the code of 3^{rd} , 3^{rd} word is the code of 4^{th} and so on.

Example

If 'Violet' is called 'Green', 'Green' is called 'Black', 'Black' is called 'White', 'White' is called 'Red', then colour of grass will be 'Black'

Explanation: Original colour '**Grass**' = '**Green**' = '**Green**'. In the given code '**Green**' is called '**Black**'. Clearly, the colour of '**Grass**' will be '**Black**'.

Example

If **'Lion'** is called **'Dog'**, **'Dog'** is called **'Elephant'**, **'Elephant'** is called **'Rat'**, then **'Rat'** will be heaviest among the given animals.

Explanation: As we know, that **'Elephant'**, is heavier than **'Dog'** and **'Lion'**. Here, **'Elephant'** is coded as **'Rat'**. Therefore, clearly, **'Rat'** will be the heaviest.

Commonly Asked Questions

If 'Chair' is called 'Table', 'Table' is called 'Pen', 'Pen' is called 'Sky', then what do we sit on?

(a) Chair (b) Pen

- (c) Sky (d) Table
- (e) None of these

Ans. (d)

Explanation: Option (d) is correct because we 'Sit' on 'Chair' but here, 'Chair' is called 'Table' Therefore, clearly, we 'Sit' on 'Table'.

If 'Lion' is called 'Pen', 'Pen' is called 'Tiger', 'Tiger', 'Tiger' is called 'Book', and 'Book' and 'Book' called 'Rubber' then we write with a

(a) Book	(b) Pen
(c) Lion	(d) Tiger

(c) Lion(e) None of these

(e) none of the

Ans. (d)

Explanation: Option (d) is correct because it is a well-known fact that we write with a **'Pen'**. But here **'Pen'** is called **'Tiger'**. Therefore, clearly, in this case we write with a **'Tiger'**.

Summary

- Coding is a system of words, letters, numbers etc. used in place of ordinary writing to keep something secret.
- While solving coding-decoding problems, students must keep in mind the positions of English letters in forward and backward order.
- Students must have the knowledge of opposite letters in English alphabet.
- Coding can be done in backward and forward alphabetical order.
- Coding can also be based on numbers.