CODING - DECODING

Coding - Decoding is a system of letters, digits and signs used for identification purposes. Codes are used for transmitting messages to the receiver without any third person knowing it. After transmission, receiver decodes the coded massage and found the relevant information.
Coding and Decoding forms a dedicated part of the Reasoning Section in various competitive exams but the level of questions differs in them.
The approach to solve the questions of this section:

- Observe alphabets or numbers given in the code keenly.
- Find the sequence it follows whether it is ascending or descending.
- Detect the rule in which the alphabets/numbers/words follow.
- Fill the appropriate letter/number/word in the blank given.

Some Basics which we need to learn before solving the questions of this topic are:

- Letter position (A=1, B=2, C=3, D=4 …… Y=25, Z=26)
- Opposite position of letters (A=26, B=25 …… Z=1)
- Opposite of each letter (A is opposite to Z and B is opposite to Y and C is opposite to X …… and so on)

Types of Coding-Decoding

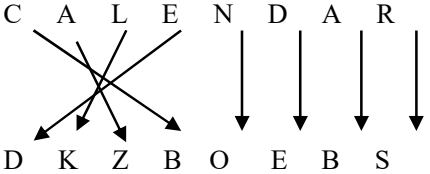
1. Letter Coding: In this type the real alphabets in a word are replaced by certain other alphabets according to a specific rule to form its code. The candidate is required to detect the common rule and answer the questions accordingly.

Example 1: If letters of the word MONKEY are coded as NPOLFZ, then find out the code for word TIGER?
Solution: Here, we are observing a very simple pattern, M is coded as N, O is coded as P and so on. Next letter is the code of previous one. So the code of word TIGER is UJHFS.

Example 2: If letters of the word MONKEY are coded as XDJMNL, then find out the code for word TIGERS?
Solution: Word MONKEY is Coded as,

So the code for word TIGERS is RQDFHS.

Example 3: If CALENDAR = DKZBOEBS, then NEELAM =?
Solution: This type is just a bit different from the previous type.
Word CALENDAR is coded as,



According to above logic, word NEELAM is coded as DDMMBN.

Example 4: If EVITCDNIV = HZNZJLWSG, then ABDICTION = ?
Solution: In this question, firstly + 2, then + 3, +4, +5, +6,+7 and so on. Similarly when the code for the word ABDICTION is made firstly+2, then +3, +4, +5, + 6 and so on. The code will finally become DFIOJBNYY.

Example 5: If PERSON = THTWRP, then ENGINE = ?
Solution: Here P + 4 = T, E + 3 = H, R + 2 = T, Then S + 4 =W, O + 3 = R, N + 2 = R. The method for coding is +4, +3, +2. The code for ENGINE will become E + 4 = I, N + 3 = Q, G + 2 = I, I + 4 = M, N + 3= Q and E +2 = G. Therefore the code is IQIMQG.

Example 6: If SILVER = HROEVI, then MEENAKSHI = ?
Solution: In this case, if the letter is at 'nth' position from the beginning then the letter at 'nth' position from the end is written. This can always be checked, whenever the sum of the number and its respective code is 27. Then the method applied for the coding would be this only. As in SILVER, S is 19 and its code H is 8 and the sum is 27. I is 9 and its code R is 18 and sum is 27. While coding MEENAKSHI, the same method coding will be applied. M is 13, so what should be added in 13 to make it 27 (that is14), write the 14^{th} letter which is N as the code for M. Similarly E is 5, find 22^{nd} letter to make sum as 27 (V is 22^{nd}letter) and that is the code and so on. The code for the word MEENAKSHI will be NVVMZPSR.

2. Alphabet to Number: In this category letters are coded in numbers or vice versa.

Example 7: If RELATION = 95312965, then MANAGEMENT = ?
Solution: In this case, the code for every letter is its position in the alphabetic order, represented as a single digit. If its position is already a single number, then it is simply assigned as the code, and if there are two digits in its position, then those digits are added to get the code for that letter. In this case R is the 18^{th} letter so its code would be 1 + 8 = 9, E is the 5^{th} letter so its code is 5, L is the 12^{th} letter so its code is 1 + 2 = 3, A is 1 and so on. Similarly when the code for the word MANAGEMENT is made. M is 13, 1 + 3 = 4. A= 1, N is 14 1 + 4 = 5, A = 1, G = 7 and so on. The final code for the word MANAGEMENT would be 4151754552.

Example 8: If SHIVANI = 574, then GANESH = ?
Solution: In this case, EJOTY of all the words has been added, multiplied by the number of letters in that word. SHIVANI => S = 19, H = 8, I = 9, V = 22, A = 1, N = 14, I = 9 => 19 + 8 + 9 + 22 + 1 + 14 + 9 = 82 × 7 (.: there are 7 letters in the word SHIVANI), Similarly while making code for GANESH => 7 + 1+ 14 + 5 + 19 + 8 = 54 × 6 (.: there are six letters) = 324 would be the code.

Example 9: If ACTIVITY = 24315137, Then ELEPHANT = ?
Solution: It involves the position of alphabet in the alphabetic order + 1. If it becomes a single digit number, write it and if it is a two digit number then add it to get a single digit number as in question no. 13. Similarly ELEPHANT => E = 5 + 1 = 6, L = 12 +1 = 13 => 1 + 3 = 4, E = 5 + 1 =6, P = 16 + 1 = 17 => 1 + 7 = 8 and so on. The code will become 64689263.

Example 10: The questions given below are based upon the following set of codes.

Digit	:	1	0	6	4	2	9	8	7	5
Code	:	M	O	X	L	S	T	N	H	P

A) Find the code for 24750.
B) Find the code for 814005.
Solution: Now here in this case, it can be verified that the code for the 2 is S, 4 is L, 7 is H, 5 is P and 0 is O. Therefore the code in the first case would become SLHPO and in the second case the code would be NMLOOP.

3. Mixed Letter Coding: In Mixed letter coding type of questions, three or four complete messages are given in the coded language and the code for a particular word is asked. To analyse such codes, any two messages bearing a common word are picked up. The common code word will mean that word.

Example 11: In a certain code language, 'it pit sit' means 'I am boy', 'it nit sit' means 'I am girl', which of the following means 'girl'?
Solution: We have,
It pit sit ⟶ I am boy
It nit sit ⟶ I am girl
Here, 'It sit' is common in both the messages and 'I am' is common in both codes. Hence, code for girl will be 'nit'.

Example 12: In a certain code language,
(i) '786' means 'study very hard'
(ii) '958' means 'hard work pays'
(iii) '645' means 'study and work'.
Which of the following is the code for 'very'?
Solution:- In the first and second statements, the common code digit is '8' and the common word is 'hard'. So, '8' means 'hard'. In the first and third statements, the common code digit is '6' and the common word is 'study'. So, '6' means 'study'.
From equation (i) and (ii), 8 ⟶ hard
From equation (i) and (iii), 6 ⟶ study
Hence very ⟶ 7

4. Substitution Coding: In this section, some particular words are assigned certain substituted names. Now, questions are formed based on those principles.

Example 13: If 'white' is called 'blue', 'blue' is called 'red', 'red' is called 'yellow', 'yellow'is called 'green', 'green' is called 'black', 'black' is called 'violet' and 'violet' is called 'orange', then what would be the colour of human blood ?
Solution: We know the colour of the human blood is 'red' and given that 'red' is called 'yellow'. So, the colour of human blood is 'yellow'.

5. Matrix Coding: In this type of questions, two matrices of letters and numbers are given in which each letters can be represented by a set of two numbers. The first number (from left) indicates the row number while the second number indicates the column number. You are required to identify the code for the given word or a group of letters on the basis of two matrices given.
Now consider the following examples which were asked in the previous exams:

Direction(14-16): In the following questions given below are two matrices of twenty five cells each containing two classes of letters from the alphabet. The columns and rows of matrix 1 are numbered from 0 to 4 and that of matrix 2 from 5 to 9. A letter from these matrices can be represented first by its row number and next by its column number. For example, R can be represented by 02, 31. In each of the following questions identify one set of number pairs out of (1), (2), (3), d) which represents the given word:

MATRIX – I

	0	**1**	**2**	**3**	**4**
0	**E**	**S**	**R**	**U**	**N**
1	**R**	**N**	**S**	**E**	**U**
2	**U**	**E**	**N**	**R**	**S**
3	**S**	**R**	**U**	**N**	**E**
4	**N**	**U**	**E**	**.,.S**	**R**

MATRIX - II

	5	**6**	**7**	**8**	**9**
5	**W**	**O**	**P**	**T**	**I**
6	**T**	**I**	**O**	**W**	**P**
7	**I**	**W**	**I**	**P**	**T**
8	**O**	**P**	**T**	**O**	**W**
9	**P**	**T**	**W**	**I**	**O**

Example 14: What is the code for PENT ?

a)87, 21, 31, 66 b)95, 33, 40, 78 c)57, 02, 34, 87 d)78, 42, 11, 58 e)None

Example 15: What is the code for NOTE ?

a)40, 75, 96, 34 b)33, 99, 87, 14 c)04, 67, 78, 21 d)22, 56, 65, 43 e)None

Example 16: What is the code for WRITER ?

a)55, 10, 66, 57, 00, 31 b)89, 12, 75, 58, 11, 23 c)76, 23, 77, 79, 13, 12
d)68, 31, 86, 87, 42,10 e)None

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Solution (14-16):

E =00, 13, 21, 34, 42
I =59, 66, 75, 77, 98
N=04, 11, 22, 33, 40
O=56, 67, 75, 88, 99
P= 57, 69, 78, 86, 95
R= 10, 12, 13, 31, 44
T= 58, 65, 79, 87, 96
W=55, 68, 76, 89, 97.

Answer 14:- (d)

Option	P	E	N	T
(1)	~~87~~	21	~~31~~	~~66~~
(2)	95	~~33~~	40	~~78~~
(3)	57	~~02~~	~~34~~	87
(4)	78	42	11	58

Answer 15: (e)

Option	N	O	T	E
(1)	40	75	96	34
(2)	33	99	87	~~14~~
(3)	04	67	~~78~~	21
(4)	22	56	65	~~43~~

Answer 16: (e)

Option	W	R	I	T	E	R
(1)	55	10	66	~~57~~	00	31
(2)	89	02	75	58	~~11~~	23
(3)	76	23	77	79	13	02
(4)	68	31	~~86~~	87	42	10

LEVEL - I

1. If in a certain language, MADRAS is coded as NBESBT, how is BOMBAY coded in that code?
A. CPNCBX B. CPNCBZ
C. CPOCBZ D. CQOCBZ

2. In a certain code, TRIPPLE is written as SQHOOKD. How is DISPOSE written in that code?
A. CHRONRD B. DSOESPI
C. ESJTPTF D. ESOPSID

3. If in a code language, COULD is written as BNTKC and MARGIN is written as LZQFHM, how will MOULDING be written in that code ?
A. CHMFINTK B. LNKTCHMF
C. LNTKCHMF D. NITKHCMF

4. In a certain code, MONKEY is written as XDJMNL. How is TIGER written ?
A. QDFHS B. SDFHS
C. SHFDQ D. UJHFS

5. In a certain code, COMPUTER is written as RFUVQNPC. How is MEDICINE written?
A. EOJDJEFM B. EOJDEJFM
C. MFEJDJOE D. MFEDJJOE

6. If VICTORY is coded as YLFWRUB, how can SUCCESS be coded ?
A. VXEEIVV B. VXFFHVV
C. VYEEHVV D. VYEFIVV

7. In a certain code, TOGETHER is written as RQEGRJCT. In the same code, PAROLE will be written as
A. NCPQJG B. NCQPJG
C. RCPQJK D. RCTQNC

8. If BOMBAY is written as MYMYMY, how will TAMIL NADU be written ?
A. TIATIATIA B. MNUMNUMNU
C. IATIATIAT D. ALDALDALD

9. If FRIEND is coded as HUMJTK, how is CANDLE written in that code ?
A. EDRIRL B. DCQHQK
C. ESJFME D. FYOBOC

10. In a code if COUNSEL is coded as BITIRAK, how is GUIDANCE written ?
A. EOHYZKBB B. FOHYZJBB
C. FPHZZKAB D. HOHYBJBA

11. If DELHI is coded as 73541 and CALCUTTA as 82589662, how can CALICUT be coded ?
A. 5279431 B. 5978213

C. 8251896 D. 8543691

12. In a certain code, RIPPLE is written as 613382 and LIFE is written as 8192. How is PILLER written in that code?

A. 318826 B. 318286
C. 618826 D. 338816

13. If ROSE is coded as 6821, CHAIR is coded as 73456 and PREACH is coded as 961473, what will be the code for SEARCH ?

A. 246173 B. 214673
C. 214763 D. 216473

14. If in a certain code, TWENTY is written as 863985 and ELEVEN is written as 323039, how is TWELVE written in that code ?

A. 863203 B. 863584
C. 863903 D. 863063

15. If the letters in PRABA are coded as 27595, and THILAK are coded as 368451, how can BHARATHI be coded ?

A. 37536689 B. 57686535
C. 96575368 D. 96855368

16. If in a certain language if ENTRY is coded as 12345 and STEADY is coded as 931785, then state which is the correct code for below word. ARREST

A. 744589 B. 744193
C. 166479 D. 745194

17. If in a certain language if ENTRY is coded as 12345 and STEADY is coded as 931785, then state which is the correct code for below word. ENDEAR

A. 524519 B. 174189
C. 128174 D. 124179

18. If ENGLAND is written as 1234526 and FRANCE is written as 785291, how is GREECE coded ?

A. 381171 B. 381191
C. 832252 D. 835545

19. In as a certain code, 15789 is written as EGKPT and 2346 is written ALUR. How is 23549 written in that code ?

A. ALEUT B. ALGTU
C. ALGUT D. ALGRT

20. In a certain code, a number 13479 is written as AQFJL and 5268 is written as DMPN. How is 396824 wriitten in that code ?

A. QLPNKJ B. QLPNMF
C. QLPMNF D. QLPNDF

LEVEL - II

Directions-(1-5) Study the following information to answer the given questions:
In a certain code 'best way to win' is written as 'ad mi ja no', ' the way to hell' is written as 'ku ja ig ad'. 'win of the day' is written as 'be ku zo mi' and 'to sell of night' is written as 'be Ii ya ja'.

1. What is the code for 'sell'?
A. be B. Ii C. ya D. Cannot be determined

2. Which of the following may represent 'hell is way'?
A. ig ad no B. ig py ya C. re ad be D. ad re ig

3. 'mi' is the code for
A. to B. win C. way D. of

4. What is the code for' best'?
A. ad B. mi C. no D. ja

5. Which of the following represents 'of the way'?
A. ku be ad B. rni be no C. ku be ya D. mi ku be

Directions (6- 10) Study the following information and answer the questions given.
In a certain code language "lu ja ka hu" means 'we provide study material', "fa ka la ju" means 'we score maximum selection', "la fu ja ju " means "study score the selection" and "ju lu na fu" means "selection of the material". Then:

6. What is the code of "score " in this code language?
A. ju B. la C. fa D. ka

7. What is the code of "provide " in this code language?
A. hu B. lu C. ka D. ja

8. What is the code of "provide of maximum"?
A. na hu fu B. fa hu na C. fu lu na D. hu fa la

9. What is the code of "we the" in this code language?
A. ka fu B. na hu C. ka na D. hu fu

10. What is the code of "material" in this code language?
A. hu B. lu C. ja D.ka

Directions (11-14): Study the following information to answer the given questions:
In a certain code, 'za la ka ga' is code for 'must obey traffic rules' ," za fa sa na ' is code for 'we obey the elders' , ' na la da sa' is a code for ' we must be elders' , and 'wa sa za da' is code for 'be elders obey younger'.

11. Which of the following is the code for ‘must’ ?

A. sa B. da C. la D. na

12. What does the code ‘za’ stand for ?

A. traffic B. must C. be D. obey

13. Which of the following is the code for ‘elders’ ?

A. sa B. wa C. za D. la

14. How does ’we of younger’ coded in the code language?

A. ka da fa B. wa ka sa C. ja da wa D. Cannot be determined

Directions (15-18): Study the following information to answer the given question :
In a certain code, ‘ze lo ka gi’ is a code for ‘must save some money’, fe ka so ni’ is a code for ‘he made good money’, ‘ni lo da so’ is a code for ‘he must be good’ and ‘we so ze da’ is a code for ‘be good save grace’.

15. Which of the following is the code of ‘must’?

A. so B. da C. lo D. ni

16. What does the code ‘ze’ stand for ?

A. some B. must C. be D. save

17. Which of the following is the code of ‘good’?

A. so B. we C. ze D. lo

18. ‘grace be money’, may be coded as ____

A. ka da fe B. we ka so C. ja da we D. ka we da

19. In a certain code language, 'col tip mot' means' singing is appreciable, 'mot baj min' means 'dancing is good' and 'tip nop baj' means 'singing and dancing'. Which of the following means 'Good' in that code language?

A. mot B. min C. baj D. cannot be determined

20. If 'green' is called 'pink', 'pink' is called 'blue' is called 'purple', 'purple' is called 'white', 'white' is called 'orange' and 'orange' is called 'peach'. What is the color of snow?

A. peach B. orange C. purple D. blue