Coding-Decoding

Coding means to hide the meaning of any message and decoding means to understand the actual meaning of that message.

In questions based on coding-decoding, a word or sentence is coded in a particular way and the candidates are asked to code other word or sentence in the same way or to decode the word or sentence.

Position of Letters in English Alphabet

Sometimes a word or a sentence is coded by changing the position of English alphabet letters according to a definite pattern, so it is necessary to remember the positions of all the letters in English alphabetical order, both in forward and backward order.
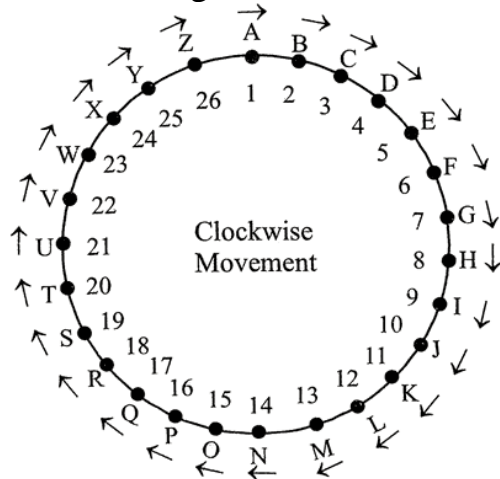
Order of the English Alphabet

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

Circular Arrangement of Letters in English Alphabet

1: Clockwise Arrangement
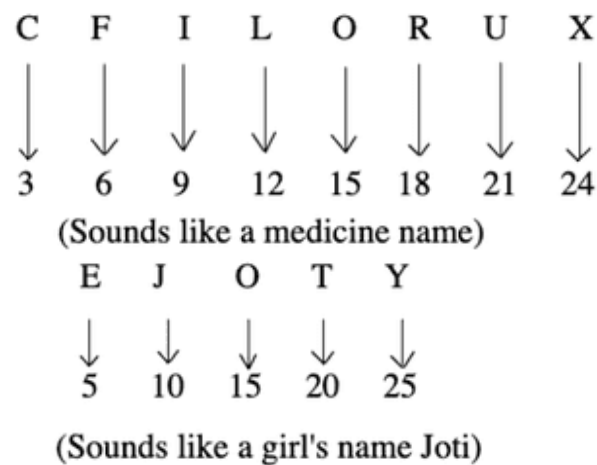
2: Anti-clockwise Arrangement
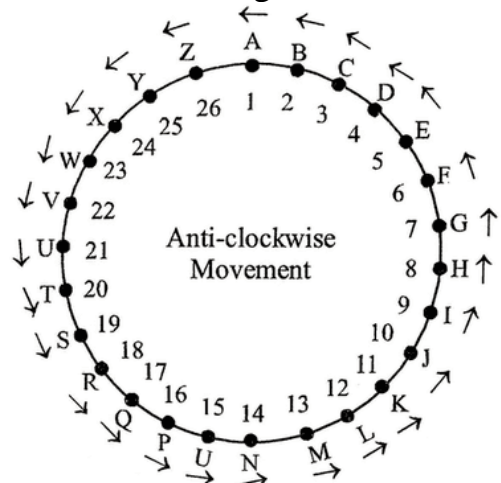
If we have to find the letter one placed forward to A, then the letter will be B and this result can be found out by using either linear or circular arrangement but when one is asked to find the letter which is one letter backward of A (Z is one letter backward A) or one letter forward of Z (A is the one letter forward Z), then only circular arrangement gives such results.

Method to Remember the Position of Letters in English Alphabet

Some method/techniques are given to remember the positions of English alphabets in forward or backward order.

1. By using EJOTY and CFILORUX formulae, we can easily remember the position of letters of English alphabet in forward order.
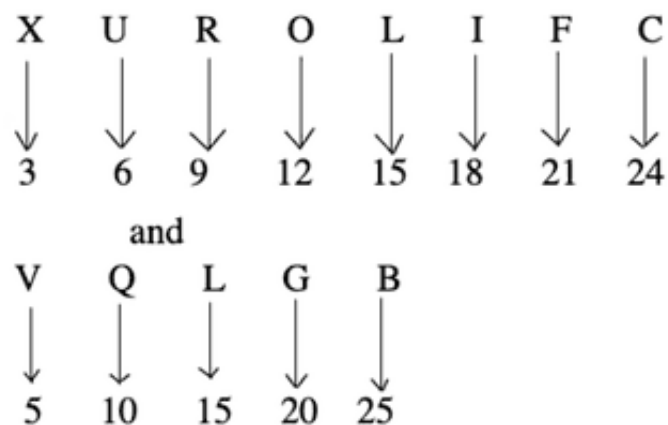
$$
\begin{array}{cccccccc}
C & F & I & L & O & R & U & X \\
\downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\
3 & 6 & 9 & 12 & 15 & 18 & 21 & 24
\end{array}
$$

(Sounds like a medicine name)

$$
\begin{array}{ccccc}
E & J & O & T & Y \\
\downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\
5 & 10 & 15 & 20 & 25
\end{array}
$$

(Sounds like a girl's name Joti)

Note:

Backward order position of a letter = 27 - Forward order position of letter

e.g. Backward order position of B = 27 - Forward order position of B = 27 - 2 = 25

2. By Using V Q L G B and X U R O L I F C, we can easily remember the position of letters of English alphabet is reverse order.

$$
\begin{array}{cccccccc}
X & U & R & O & L & I & F & C \\
\downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\
3 & 6 & 9 & 12 & 15 & 18 & 21 & 24
\end{array}
$$

and

$$
\begin{array}{ccccc}
V & Q & L & G & B \\
\downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\
5 & 10 & 15 & 20 & 25
\end{array}
$$

Types of Coding - Decoding

Type #1: Letter/Number Coding

In this type of coding, we deal with questions, in which the letters of a word are replaced by certain other letters or numbers according to a specific pattern/rule to form a code. You are required to detect the coding pattern/rule and answer the question(s) that are asked, based on that coding pattern/rule.

Example 1: In a certain code language, 'GIVE' is written as 'VIEG' and 'OVER' is written as "EVRO'. How will 'DISK' be written in that same code?
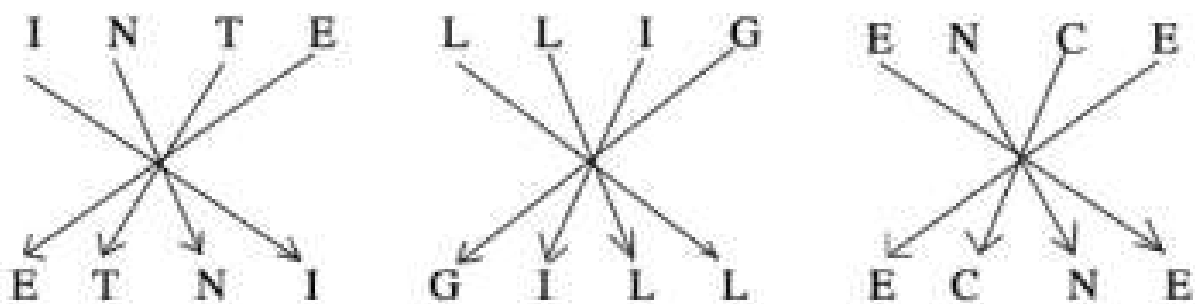
(a) SIDK
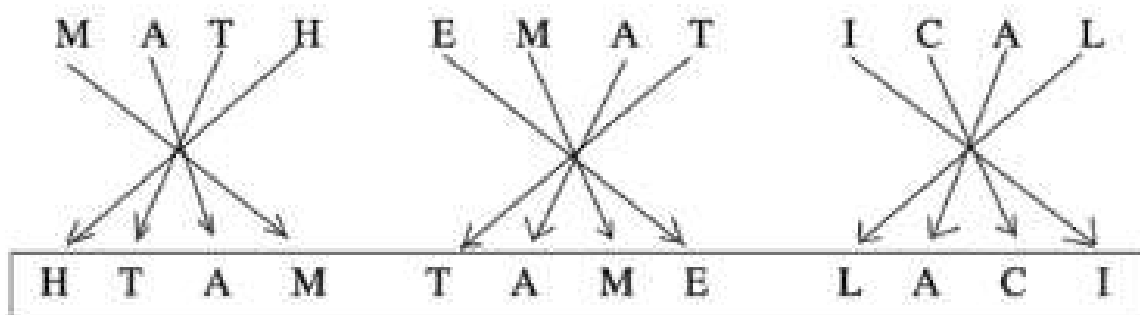(b) KISD
(c) KDSI
(d) SIKD
Solution: (d)
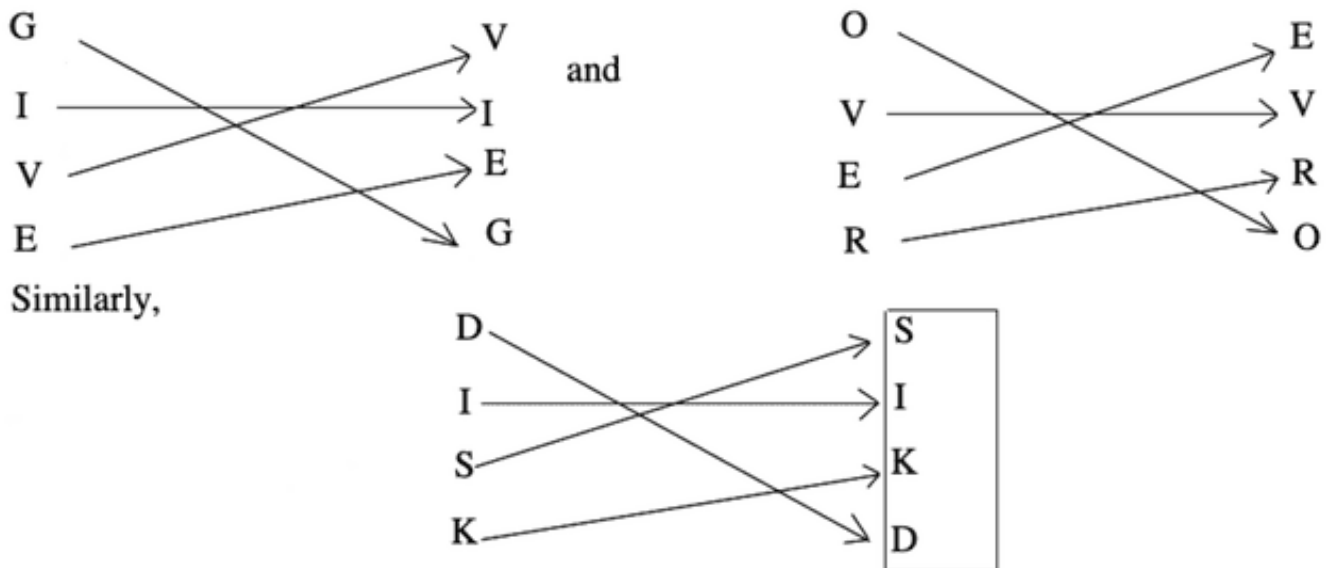
Similarly,

Example 2: If in a certain code 'INTELLIGENCE' is written as 'ETNIGILLECNE', then how can 'MATHEMATICAL' be written in the same code?

(a) AMHTMETACILA   (b) TAMMEHTALAC

(c) HTAMTAMELACI   (d) LACITAMEHTAM

Solution: (c)

Similarly,

M A T H   E M A T   I C A L

H T A M   T A M E   L A C I

Example 3: If GOODNESS is coded as HNPCODTR, then how GREATNESS can be written in that code?

(a) HQZSMFRT
(b) HQFZUFRTM
(c) HQFZUODTR
(d) HQFZUMFRT

Solution: (d) Clearly, the letters in the word GOODNESS are moved one step forward and one step backward, alternately to obtain the letters of the code.

G	O	O	D	N	E	S	S
+1	-1	+1	-1	+1	-1	+1	-1
H	N	P	C	O	D	T	R

Similarly,

G	R	E	A	T	N	E	S	S
+1	-1	+1	-1	+1	-1	+1	-1	+1
H	Q	F	Z	U	M	F	R	T
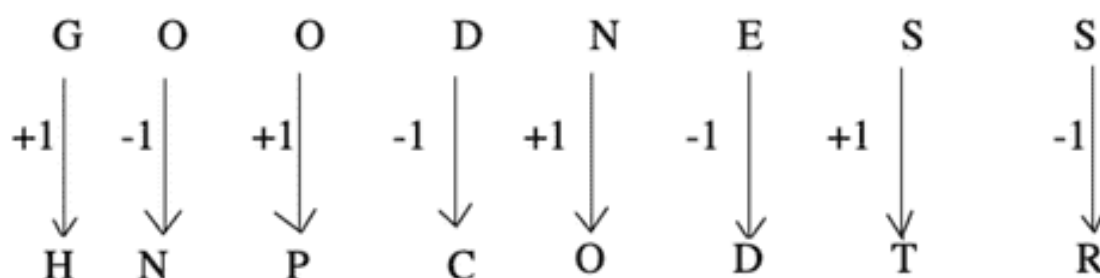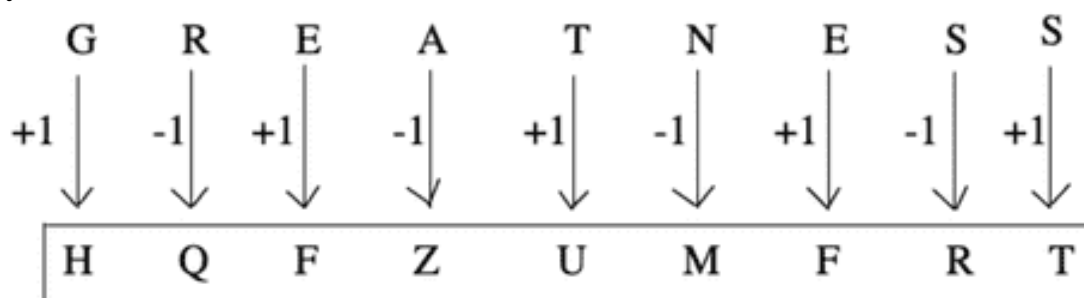
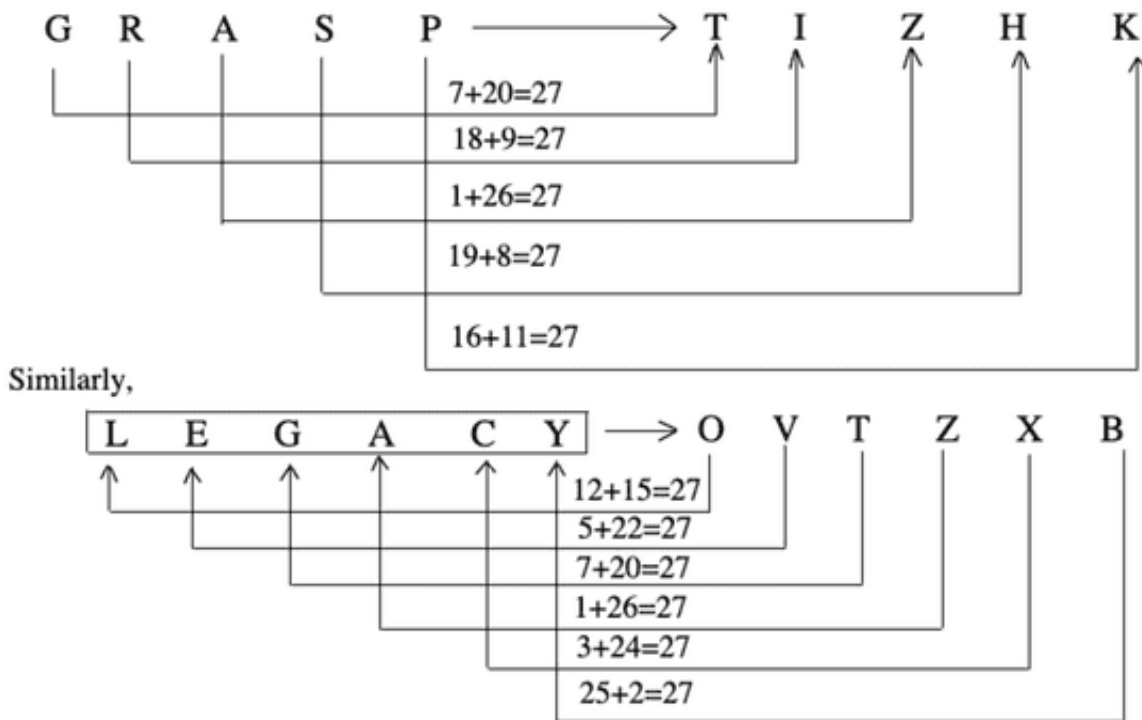*Example 4:* If GRASP is code as TIZHK, what will be code as OVTZXB?

(a) LEGATE   (b) LEAGUE

(c) LEGACY   (d) LEDGER

Solution: (c)

```
G    R    A    S    P  ――――――→  T    I    Z    H    K
│    │    │    │    │                ↑    ↑    ↑    ↑    ↑
│    │    │    │    └── 7+20=27 ─────┘    │    │    │    │
│    │    │    └────── 18+9=27 ──────────┘    │    │    │
│    │    └────────── 1+26=27 ───────────────┘    │    │
│    └────────────── 19+8=27 ────────────────────┘    │
└──────────────────  16+11=27 ───────────────────────┘
```

Similarly,

```
L    E    G    A    C    Y  ――→  O    V    T    Z    X    B
↑    ↑    ↑    ↑    ↑    ↑             ↑    ↑    ↑    ↑    ↑
│    │    │    │    │    └── 12+15=27       │    │    │    │
│    │    │    │    └────── 5+22=27 ────────┘    │    │    │
│    │    │    └────────── 7+20=27 ─────────────┘    │    │
│    │    └────────────── 1+26=27 ──────────────────┘    │
│    └────────────────── 3+24=27 ───────────────────────┘
└────────────────────── 25+2=27
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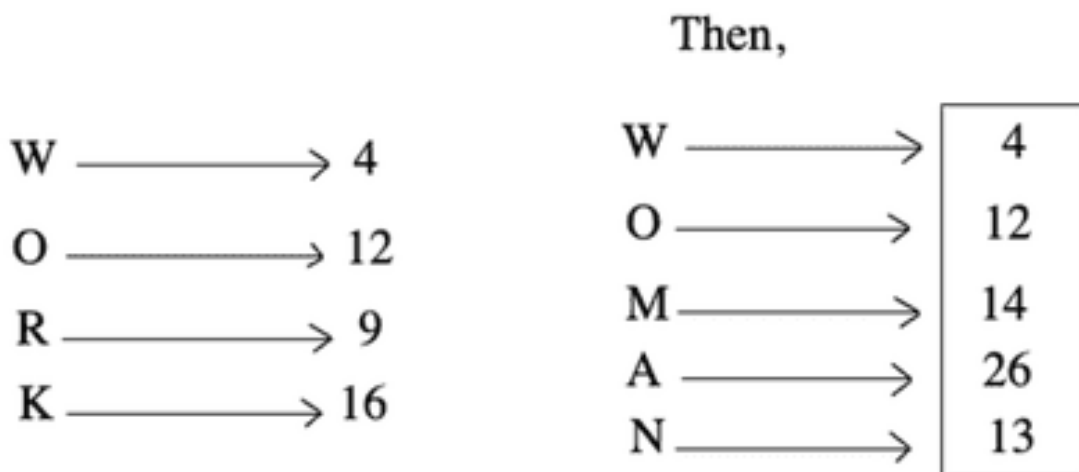
Example 5: If 'WORK' is coded as '4-12-9-16', then how will you code 'WOMAN'?

(a) 4-12-14-26-13   (b) 4-26-14-13-12

(c) 23-12-26-14-13   (d) 23-15-13-1-14

Solution: (a)

Then,

```
W ――――――→ 4          W ―――――→  4

O ――――――→ 12         O ―――――→  12

R ――――――→ 9          M ―――――→  14

K ――――――→ 16         A ―――――→  26

                     N ―――――→  13
```

Here, each letter is coded by the numerical value obtained by subtracting its 'position value' in English alphabetical order, from 27, e.g. letters W, O, M, A, N are at 23rd, 15th, 13th, 1st and 14th position in alphabetical order. So, their codes are (27 - 23), (27 - 15), (27 - 13), (27 - 1), (27 - 14), i.e. 4, 12, 14, 26, 13 respectively i.e. their backward order position.

Example 6: If CUP = 40, then KITE = ?

(a) 10   (b) 20

(c) 30   (d) 45

Solution: (d) Using forward letter positions,

$$\begin{matrix} 3 & 21 & 16 \\ \text{As,} \quad C & U & P \end{matrix} \implies 3 + 21 + 16 = 40$$

Similarly,

$$\begin{matrix} 11 & 9 & 20 & 5 \\ K & I & T & E \end{matrix} \implies 11 + 9 + 20 + 5 = \boxed{45}$$

Example 7: If BAG = 71, then VICE = ?

(a) 69   (b) 70

(c) 75   (d) 90

Solution: (a)

$$\begin{matrix} 25 & 26 & 20 \\ \text{As,} \quad B & A & G \end{matrix} \implies 25 + 26 + 20 = 71$$

Similarly,

$$\begin{matrix} V & I & C & E \\ \downarrow & \downarrow & \downarrow & \downarrow \\ 5 & 18 & 24 & 22 \end{matrix}$$

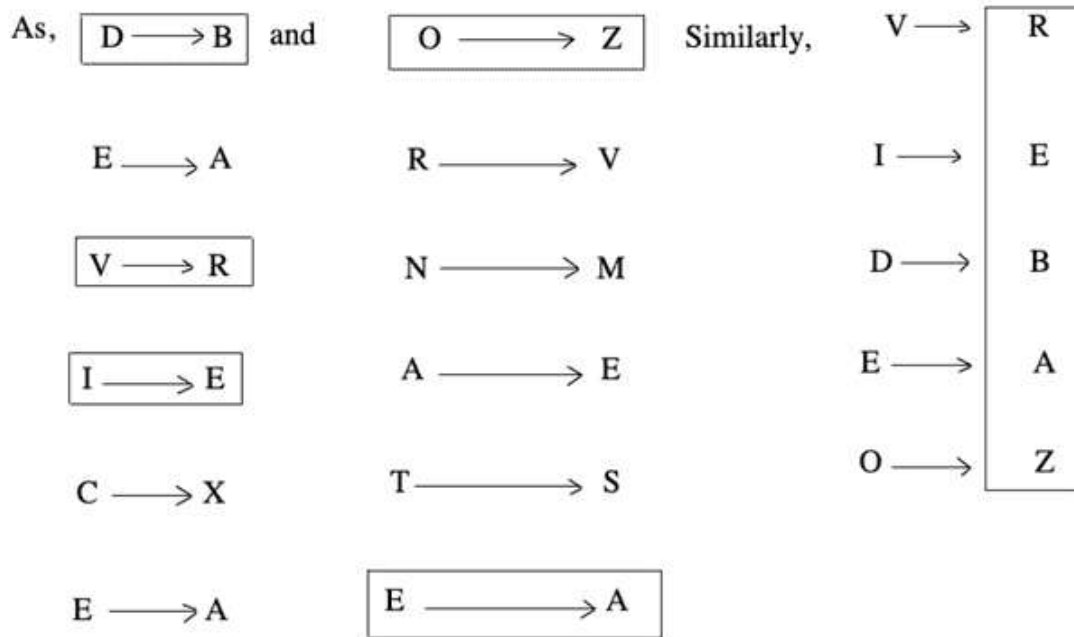$$= 5 + 18 + 24 + 22 = \boxed{69}$$

Type #2: Direct Coding

In direct coding, the code letters/numbers/ symbols occur in the same sequence as the corresponding letters occur in the words. This is basically a direct substitution method.

Example 8: If DEVICE is coded as BAREXA and ORNATE is coded as ZVMESA, what VIDEO be coded as?

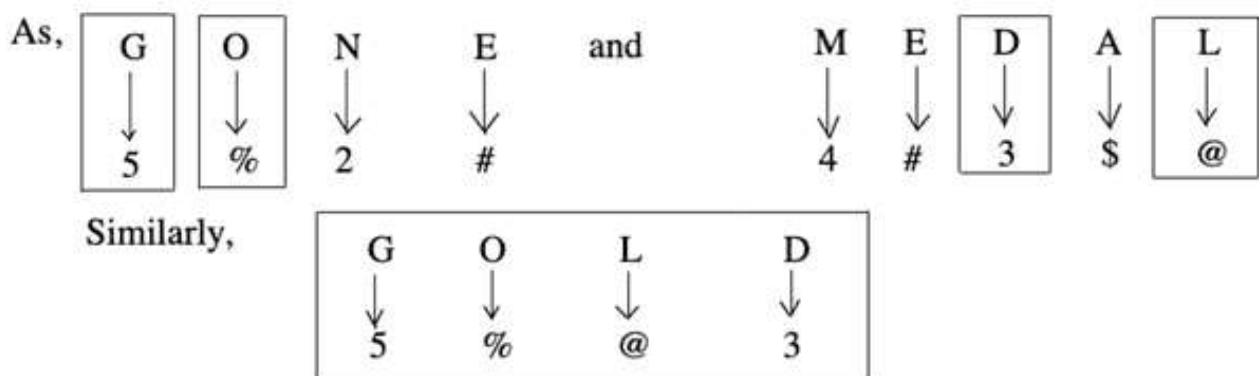(a) RIBAZ   (b) REBAZ

(c) RBEAZ   (d) ZABER

Solution: (d) Using direct letter coding method,

As, | D ⟶ B | and | O ⟶ Z | Similarly, V ⟶ | R |

E ⟶ A   R ⟶ V   I ⟶ | E |

| V ⟶ R | N ⟶ M   D ⟶ | B |

| I ⟶ E | A ⟶ E   E ⟶ | A |

C ⟶ X   T ⟶ S   O ⟶ | Z |

E ⟶ A | E ⟶ A |

Example 9: In a certain code, 'GONE' is written as 5 % 2 # and 'MEDAL' is written as 4 # 3 $ @, then how will 'GOLD' be written in that code?

(a) 5 @ % 3

(b) 5 % @ 3

(c) 5 # @ 3

(d) 5 % # 3

Solution: (b) Using direct coding method,

As, | G   O | N   E   and   M   E | D | A | L |
       ↓   ↓   ↓   ↓   ↓   ↓   ↓   ↓   ↓
       5   %   2   #   4   #   3 $ @

Similarly, | G   O   L   D |
             ↓   ↓   ↓   ↓
             5   %   @   3

Therefore, GOLD => 5 % @ 3

Type #3: Conditional Coding

In this type, letters/numbers are given along with their code. Candidates are required to find the codes for a particular letter group/word/number according to certain conditions given in the questions.

Directions (Examples 11 - 13) Study the following letters and their corresponding digits code followed by certain conditions of coding and then answer the questions given below them by finding out which of the digits combinations given in (a), (b), (c) and (d) is the coded form of the letters-groups given in each question and mark your answer accordingly.

Letters	P	N	A	J	I	R	E	B	U	K
Digits/Codes	5	3	9	1	4	6	2	7	0	8

Conditions
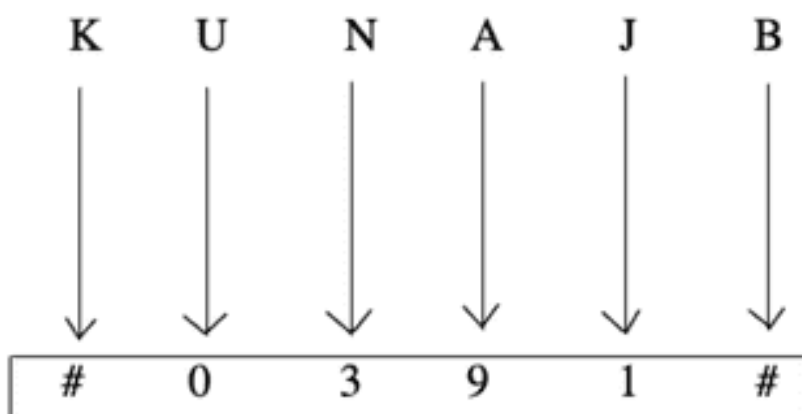
(I)   If both the first and the last letters in the group are vowels, both should be coded as $.

(II)   If both the first and the last letters in the group are consonants, both should be coded as #.

Example 11: KUNAJB

(a) 803917

(b) 0391

(c) #0391#

(d) #0391$

Solution: (c) We know that, in English alphabets A, E, I, O, U letters are vowels and remaining letters are consonants.

From condition (II),

Example 12: RBUKAE

(a) #70892

(b) 670892

(c) 670982

(d) 607892

Solution: (b) We know that, in English alphabets A, E, I, O, U letters are vowels and remaining letters are consonants.
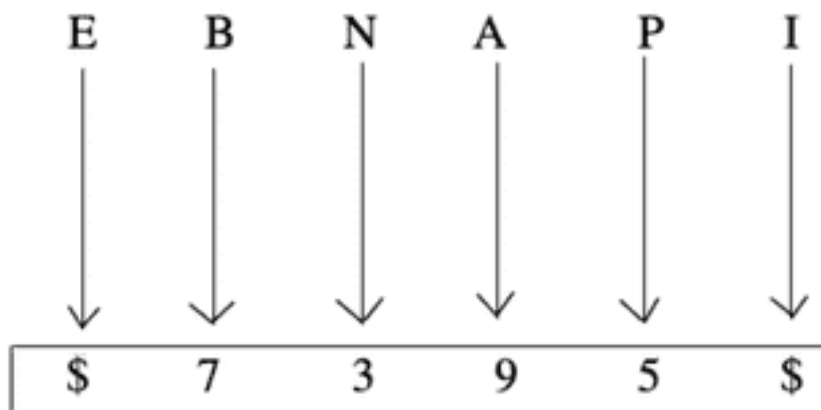
Example 13: EBNAPI

(a) 273954

(b) 7395

(c) #7395#

(d) $7395#

Solution: (b) We know that, in English alphabets A, E, I, O, U letters are vowels and remaining letters are consonants.

From condition (I),

EXERCISE

Q. 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

Q. 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

Q. 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

Q. 4. In a certain code, MONKEY is written as XDJMNL. How is TIGER written in that code?

(a) QDFHS

(b) SDFHS

(c) SHFDQ

(d) UJHFS

Q. 5. If FRAGRANCE is written as SBHSBODFG, how can IMPOSING be written?
(a) NQPTJHOJ

(b) NQPTJOHI

(c) NQTPJOHJ

(d) NQPTJOHJ

Q. 6. Suppose that a particular 'TIGER' is written as 'QDFHS'. Find out how 'FISH' will be written in the same code?
   A. GERH
   B. GRHE
   C. GREH
   D. GHRE

Q. 7. Using a particular code 'HILTON' is encrypted as 'IHTLNO'. Choose the right option for 'BILLION' coded in the same form?

A. IBLLION
B. IBOILLN
C. IBLLOIN
D. IBLOILN

Q. 8. If 'FROZEN' is decoded as 'OFAPSG'. Tick the right option that depicts 'MOLTEN' written in this way?

A. OFPOMN
B. OFSMPN
C. OFUMPN
D. OFUNPN

Q. 9. If BROWN is written as 'ZPMUL', then VIOLET is coded as
A. TGMJCR
B. SGMJCQ
C. TGMJCQ
D. TGWCQ

Q. 10. If CHAIR is written as '12345', RENT is written as '5678', and then REAR is written as
A. 5635
B. 5356
C. 5365
D. 5653

Q. 11. If a dog is called "cat", cat is called "lion", lion is called "rat", then which of these lives in a forest?
A. Rat
B. Lion
C. Dog
D. Cat

Q. 12. If the desk is called "chair", chair is called "blackboard", blackboard is called "duster", duster is called "chalk", and then where do you sit in the classroom?
A. Blackboard
B. Chair
C. Desk
D. Duster

Q. 13. If cake is called "egg", if egg is called "coffee", coffee is called "tea", then which is white
in colour?
A. Cake
B. Egg
C. Coffee
D. Tea

Q. 14. If January is called "March", March is called "April" and April is called "May", then which of the following months will have only 30 days?
  A. January
  B. March
  C. April
  D. May

Q. 15. If NECK is written as '123%', LUCK is written as '+@3%' and LIKE is written as '+÷%2', then NICE is written as
  A. 1%÷3
  B. 1÷32
  C. 1÷@2
  D. ÷13+

Q. 16. If MEDICO is written as 'PBGFFL', then DOCTOR is coded as
  A. GLFQRO
  B. GLFQLR
  C. GLFQLS
  D. GRFWLQ

Q. 17. In a certain code language COMPUTER is written as RFUVQNPC. How will MEDICINE be written in that code language?
  A. MFEDJJOE
  B. EOJDEJFM
  C. MFEJDJOE
  D. EOJDJEFM

Q. 18. In a certain code language, '134' means 'good and tasty'; '478' means 'see good pictures' and '729' means 'pictures are faint'. Which of the following digits stands for 'see'?
  A. 9
  B. 2
  C. 1
  D. 8

19. If Z = 52 and ACT = 48, then BAT will be equal to
  A. 39
  B. 41
  C. 44
  D. 46

20. 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

Answers:

1. B
2. A
3. C
4. A
5. D
6. B
7. C
8. C
9. A
10. A
11. A
12. A
13. C
14. D
15. B
16. A
17. D
18. D
19. D
20. B