

Pre- Class Notes On Coding, Decoding, Directions & Cubes

Coding & Decoding:-

For conveying secret messages from one place to another, especially in Defense Services, coding is used. The codes are based on various principles/patterns such that the message can be easily be deciphered at the other end. Now-a-days, in certain competitive examinations, such questions are given to judge the candidates' intelligence and mental ability. They are required to encode and decode words and sentences after observing the pattern and principles involved. These questions can be broadly classified into 5 main categories, as follows:

- (i) Coding with Letters of Alphabets
- (ii) Coding with Numerical Digits (Numbers)
- (iii) Mixed Coding (Both Alphabetical and Numerical)
- (iv) Coding with Arbitrary Signs / Symbols
- (v) Miscellaneous Type

Coding with Letters of Alphabet:

In these questions, the letters of the alphabets are exclusively used. These letters do not stand for themselves but are allotted some artificial values based on some logical patterns/analogies. By applying those principles or observing the pattern involved, the candidates are required to decode a coded word or encode a word. These can be further classified into the following categories :

Eg- If in a code, 'MASTER' is written as 'SAMRET', then how 'CARROT', be written in the same code.

(a) ARMOTR, (b) RCATRO, (c) RCATOR, (d) ARMTOR.

In such type of question we try to find out relationship between Word & its code, & then use same relationship, to Code the required word.

Like in above question, 'MASTER', is written as 'SAMRET', so here position of alphabet M & S are interchanged among themselves. Position of 'A' is unchanged. Again, Position of alphabet T & R is interchanged among them. Position of 'E' is unchanged

Using above relationship, we will find the code of 'CARROT' from among the options given, which come out to be- 'RCTOR'.

Coding with Numerical Digits:

The pattern of coding with numerical digits is similar to that of coding with alphabets except the use of numerical digits with the assignment of some artificial values. The values are allotted based on some specific pattern which has to be discerned by the candidate in order to solve the problem in the quickest possible time.

If TRAIN is coded as 23456, how will you code TIN and RAIN?

The answer will be 256 for TIN and 3456 for RAIN. T = 2, R = 3, A = 4, I = 5, and N = 6. These values have been allotted arbitrary; based on logical relationship,

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Coding with Specific Pattern:

This is the pattern of coding which exhibits the natural correlation of Arabic numbers with alphabetic letters. For instance, alphabets A to Z are assigned the numeric codes from 1 to 26 where each letter gets the assignment in the pattern as follow A = 1, B = 2, C = 3, etc.

The sequence is classified as follows:

Forward sequence (e.g. A = 1, B = 2, etc.)

Backward sequence (e.g. Z = 1, Y = 2, A = 26, etc.)

Random Sequence (e.g. A = 2, B = 3 or A = 4, B = 6, C = 8 or any other pattern following a particular sequence).

Forward Sequence:

Ex. If 'PACE' is code as 16-1-3-5, how will you code the ACTED, Using the logic, & alphabetic values, answer will be 1-3-20-5-4

Backward Sequence:

Ex. If GREAT is coded as 20-9-22-26-7, how will you code the FATE, , Using the logic, & backward sequence, answer will be 1-3-20-5-4

Random sequence:

The sequence will not follow a specific pattern of assignment as in other cases but will surely show a pattern at a strict analysis. The pattern can be established by various ways but in every case a set principle/pattern is involved which has to be discovered by careful examination of the question.

Eg-If BREAD is coded as "2-18-0-0-4", how will you code COOL.

A strict analysis of the question reads that the vowels 'E' & 'A' are assigned the code '0'. The rest of the letters follow the regular sequence of numerical assignment, i.e. B = 2, C = 3, etc. Based on the above pattern, the answer is 3-0-0-12

Mixed Coding (Letters + Digits):

Mixed coding takes the pattern of coding with both the letters of alphabets and numerical assignment. The candidates are required to study the analogy given in question.

Eg-If "A – 3 – T – 5 – D" stands for ACTED and "D1T5D" stands for "DATED", how will you code FADED?

Answer - F1D5D

Coding with Arbitrary Signs / Symbols:

The pattern of coding here takes an extensive use of arbitrary signs and symbols. A careful deciphering required to decode the question series.

Ex.1 If "M I S S I O N" is coded " ! ? ? ! φ \$" and " LENS" is coded "@#\$?", then how will you code "L I O N E S S"?

Ans. A careful deciphering of the two codes reads the following:

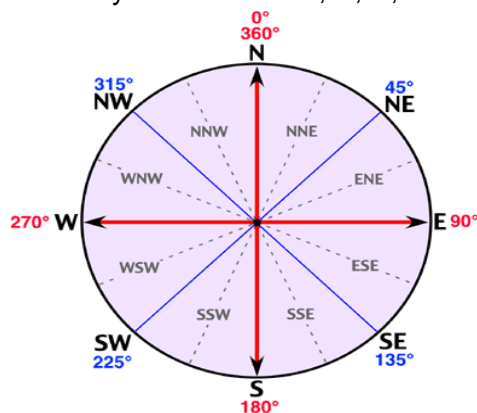
M	I	S	O	L	E	N
*	!	?	φ	@	#	\$

Therefore, L I O N E S S will be coded as "@ ! φ \$ # ? ?"

Directions:-

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The four **cardinal directions** or **cardinal points** are the directions of north, south, east, and west, commonly denoted by their initials: N, S, E, W.



Cubes:-

A cube is a three dimensional figure having its length, breadth, & height, equal to each other. There are 6 faces, 8 corners, & 12 edges.

Points to be Noted:-

- a. The number of small cubes that can be cut out from one big cube

$$= \frac{\text{Side of big cube}}{\text{side of small cube}}$$
- b. If one big cube whose all sides are colored in same color, is cut into small cubes,
 - I. Number of cubes having only one colored faces = $(x - 2)^2 \times \text{Number of faces}$, where $x = \frac{\text{Side of big cube}}{\text{side of small cube}}$
 - II. Number of cubes having only two colored faces = $(x - 2) \times \text{Number of faces}$, where $x = \frac{\text{Side of big cube}}{\text{side of small cube}}$
 - III. Number of cubes having only three colored faces = Number of corners,
 - IV. Cubes having no colored face = $(x - 2)^3$, where $x = \frac{\text{Side of big cube}}{\text{side of small cube}}$