SELF LEARNING MATERIAL
UNIT-1
Coding & Decoding

1.0 OBJECTIVES:

After reading this unit, you will be able to:

- Coding Based on Rearrangement of Letters
- Coding Based on Replacement of Letters
- Opposite Letters Coding
- Coding of Letters by Their Left and Right Letters
- Number Coding
- Symbol Coding Based on Similarity
- Coding by Substitution/Word Replacement
- Fictitious Language Coding
- Coding by Comparison

1.1 INTRODUCTION:

Coding-Decoding is process of transmitting an information from one place to other using some suitable codes, so that it might reach to other person safely. Coding-decoding of an information is done with various rules or patterns, so that only the right person can decipher it.

This process of coding-decoding basically involves

Coding

When any letter/word/sentence is written or said in such a language which hides the actual meaning of that particular letter/word/sentence from others except the desired person.

Decoding

It helps in tracing out the actual meaning of a coded letter/word/sentence. Generally, coding is done on the basis of the letters

of English alphabet and their corresponding positions. In these questions, a word (basic word) is coded in a particular way and candidates are asked to code other words in the same way. As the matter of fact, there exists no uniform and particular type or category of these questions according to which we could classify questions of coding-decoding. However, keeping in view the candidate's convenience, we have classified different types of questions with illustrations and explanations under different headings.

1.2 Letter Coding

In this type of questions, the letters of a certain word are arranged in different orders which can be reverse order or fragmented order in which first-half of the word follows some other rule and second part of the word follows some other rule for coding. The candidates are therefore required to understand the different patterns of the letter coding and solve different types of problems based on these patterns which are discussed below.

Example 1.1: If in a certain code language 'RAMESH' is written as 'HSEMAR', then how will 'CREATE' be written in that language?

Solution:

All the letters of a word are written in reverse order.

As, RAMESH —> HSEMAR Similarly, CREATE

CREATE = ETAERC

CHECK YOUR PROGRESS 1.1:

1. (a) If in a coded language 'BRINJAL' is written as 'LAJNIRB' then how will 'LADYFINGER' be written in that code?

(b) If in a certain code language 'THREAT' is written as 'RHTTAE', then how will 'PEARLY' be written in that code?

(c) If in a certain code language 'GREAT' is written as 'GRETA' then how will 'FIGHT' be written in that code?

2. (a) If in a certain code language 'SECTOR' is written as 'ESCTOR', then how will 'MOTHER' be written in that code?

(b) If in a certain code language 'SECTOR' is written as 'SOTCER', then how will 'MOTHER' be written in that code?

(c) If in a certain code language 'MIGHT' is written as 'GHMTI' then how will 'EARTH' be written in that code?

 # # Answers are given at the end of the document.

Example 1.2: If in a certain code language 'TREND' is written as 'USFOE' then how will 'ENTRY' be written in that code?

Solution:

20	18	5	14	4
T	R	E	N	D

Add one to the value=

21	19	6	15	5
U	S	F	O	E

ENTRY = FOUSZ

CHECK YOUR PROGRESS 1.2:

1. (a) If 'PEACE' is coded as 'RGCEG', then how is 'MICKY' coded in the code?

(b) If in a certain code language 'FRESH' is written as 'EQDRG', then how will 'BLEND' be written in that code?

2. (a) If in a certain code language 'NAME' is written as 'OYPA', then how will 'TEAM' be coded in that language?

(b) If 'SILVER'is coded as 'ZXYBDQ 'and 'KAMAL' is coded as LNCNY, then what will be the code for 'VIKAS'?

 # # Answers are given at the end of the document.

1.3 Opposite Letters Coding:

These are called opposite letters as the forward order corresponding position of an opposite letter is as same as the backward order corresponding position of its opposite letter.

A and Z is a pair of opposite letters. Now, it is clear that two letters are called opposite to each other, if sum of their corresponding positions is equal to 27.

Example 1.3: If in a certain code language 'NOTION' is written as 'MLGRLM' then how will 'VECTOR' be written in that language?

Solution:

14	15	20	9	15	14
N	O	T	I	O	N
|	|	|	|	|	|
13	12	7	18	12	13
M	L	G	R	L	M

In the same way (sum of the numbers is equal to 27)

VECTOR = EVXGLI

CHECK YOUR PROGRESS 1.3:

1. (a) If in a certain code language 'NEETA' is written as 'MWGZ', then what word will be written for 'IZHSNR'?

(b) If in a certain code language 'TIGER' is written as 'GRTVT, then what word will be written for 'HMZPV'?

2. (a) In a certain code, 'CLOCK' is written as 'XOLXP'. How will 'LOTUS' be written in that same code?

(b) In a certain code, 'LATE' is written as 'VGZO'. How will 'SHINE' be written in that same code?

 # # Answers are given at the end of the document.

1.4 Coding of Letters by Their Left and Right Letters

Under this pattern each letter of a letter group/word is coded by its left and right letters of English alphabet. Let us consider the coding of ABCD

Example 1.4: If in a certain code language 'BAT' is written as 'ACZBSU', then how will 'SIX' be written in that code?

Solution:

Here, each letter is coded by its left and right letters.

B=AC

A=ZB

T=SU

Similarly, SIX = RTHJWY

CHECK YOUR PROGRESS 1.4:

1. If in a certain code language 'GO' is written as 'FHNP', then how will 'SUN' be written in that language?

2. If in a certain code language 'LAP' is coded as 'KMZBOQ', then how will 'NOTE' be written in that language?

3. If in a certain code language 'TOP' is written as 'OQNPSU', 'RAT' is written as 'SUZBQS', then how will 'GUN' be coded in that language?

4. If in a certain code language 'RAM' is written as 'QSZBLN', 'LOVE' is written as 'KMNPUWDF', then how will 'ACT' be written in that language?

5. If in a certain code language 'NAME' is written as 'MOZBLNDF', 'PUN' is written as 'OQTVMO', then how will 'TALK' be coded in that language?

 # # Answers are given at the end of the document.

1.5 Number Coding:

In number coding, numerical code is assigned to the word or the alphabetical letters and candidates are required to analyse the codes as per the correlation between these numbers and letters. This correlation is based on certain pattern according to the position of letters in English alphabet as per a set of given rules.

Example 1.5: If in a certain code language 'PUT' is written as '57' then how will 'BAT' be written in that language?

Solution:

Here, forward order letter positions are added

P+U+T= 16+21+20= 57

B+A+T= 2+1+20= 23

Example 1.6: If PKROK is coded as 72962 and KRRPK as 29972, then how can NJMLZ be coded?

Solution: According to the given code system, P is coded as 7, K as 2, R as 9 and O as 6 that means code of NJMLZ does not have either 7, 2, 9 or 6. Hence, required code will be 51430

CHECK YOUR PROGRESS 1.5:

1. If in a certain code language 'RAMAN' is coded as '18113114', then how will 'KAPILA' be coded in that language?

2. If in a certain code language 'BHAI' is written as '2819', then how will 'CDGH' be written in that language?

3. If in a certain code language 'HIGH' is written as '8978', then how will 'DEAF' be written in that language?

4. If in a certain code language 'HACB' is written as '8132', then how will 'DEFA' be written in that language?

5. If in a certain code language 'PAPER' is written as '16116518', then how will 'BRINJL' be written in that language?

 # # Answers are given at the end of the document.

1.6 Symbol Coding Based on Similarity:

In symbol coding, various symbols are assigned to the letters of a word and based upon their correlation or similarity, the candidates are required to determine the rules or pattern which is being followed. Under this pattern each letter of a letter group/word is coded on the basis of the similarity of two or more given codes.

Example 1.7: 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?

Solution:

G=5 O=% N=2 E=# M=4 D=3 A=$ L=@

GOLD=>5%@3

CHECK YOUR PROGRESS 1.6:

1. If in a certain code language 'STAR' is written as '5 $ ★ 2', 'TORE' is written as '$ 3 2 then how will 'OATS' be written in that language?

2. If in a certain code language 'GONE' is written as '5 @ © g' and 'SEAL' is written as '6 9 % then how will 'LOGS' be written in that language?

3. If in a certain code language 'FIRE' is written as '# % @ $' and 'DEAL' is written as '© $ ★ then how will 'FAIL' be written is that language?

4. If in a certain code language 'ROPE' is written as '% 5 7 $', 'DOUBT' is written as '3 5 # 8 and 'LIVE' is written as '@2 4 $', then how will 'TROUBLE' be written in that language?

5. In a certain code, 'BASKET' is written as '5$3%#1' and 'TRIED' is written as '14 ★ # 2'. How is 'SKIRT' written in that code?

 # # Answers are given at the end of the document.

1.7 Coding by Substitution/Word Replacement

In substitution or word replacement, a confusing code is provided by giving a different name for the word. Under this pattern, a series of words is given and each word of this series is coded with another word. Candidates are required to find out the code for a word in the given series and then provide the right information regarding the word.

Example 1.8: If 'green' is called 'red', 'red' is called 'blue', 'blue is called white', 'white' is called 'yellow', 'yellow' is called 'violet', then what is the colour of grass?

Solution:

As, colour of grass is ‘green’ but here ‘green’ is called ‘red’ and hence according to the given information colour of grass must be ‘red’.

CHECK YOUR PROGRESS 1.7:

1. If 'RED' is called 'GREEN', 'GREEN' is called 'YELLOW', 'YELLOW' is called 'VIOLET', 'VIOLET' is called 'BLUE',' BLUE' is called 'ORANGE', then what is the colour of 'Lady Finger'?

2. . If 'DOG' is called 'COW', 'COW' is called 'LION, 'LION' is called 'BUFFALO', 'BUFFALO' is called 'OX', 'OX' is called 'CAT', then which of the following animals is wild one?

3. If 'CAR' is called 'BIKE', 'BIKE' is called 'BICYCLE', 'BICYCLE' is called 'SCOOTER', 'SCOOTER' is called 'TRAIN', 'TRAIN' is called 'AEROPLANE', then which one of the following options is associated with railways?

4. If 'GREEN' is called 'BLUE', 'BLUE' is called 'WHITE', 'WHITE' is called 'RED', 'RED' is called 'VIOLET', then what is the colour of grass?

5. If 'ROAD' is called 'CAR', 'CAR' is called 'TRAIN', 'TRAIN' is called 'SCHOOL', 'SCHOOL' is called 'HOUSE', 'HOUSE' is called 'OFFICE', then where do children go to study?

 # # Answers are given at the end of the document.

1.8 Fictitious Language Coding

In this type of questions, some messages are provided in the code language and some codes are assigned to each word of the messages. The candidates are required to decipher the code of each word by finding the common code for two words and this process is followed to decipher the code for each word thereafter and hence the entire message is decoded.

Example 1.9: In a certain code language 'he is great'is written as 'ka pa ra'and 'is Ram hungry'is written as 'na sa ka'. Find the code for 'is'.

Solution:

he(is) great----------> (ka) pa ra

(Is) Ram hungry-------- > na sa(ka)

Clearly, code for ‘is’ = ka

In the above example, code for ‘he’ = pa or ra

code for ‘great’ = pa or ra

code for ‘Ram’ = na or sa

code for ‘hungry’ = na or sa

CHECK YOUR PROGRESS 1.8:

1. If in a certain code language 'Sachin is great' is written as 'ga ma ra', 'is he poor' is written as' 'ta sa ga', then find the code for 'is'?

2. If in a certain code language 'fruits are sweet' is written as 'pa ma la' and 'you are sweet' is written as 'pa ma ta', then find the code for 'fruits'If 'DOG' is called 'COW', 'COW' is called 'LION, 'LION' is called 'BUFFALO', 'BUFFALO' is called 'OX', 'OX' is called 'CAT', then which of the following animals is wild one?

3. If in a certain code language 'pick and choose' is written as 'ko ho po1 and 'pick up and come' is written as 'to no ko po', then how will 'pick' be written in that language?

4. If in a certain code language 'open the door' is written as 'ka te jo', 'door is closed' is written as 'jo pa ma' and 'this is good' is written as la ra pa', then how will 'closed' be written in that language?

5. In a certain code language, 'Sue Re Nik' means 'She is brave', 'Pi Sor Re Nik' means 'She is always smiling' and 'Sor Re Zhi' means 'Is always cheerful'. What is the code used for the word' smiling' ?

 # # Answers are given at the end of the document.

1.9 Coding by Comparison

Under this pattern, some words are given in one column and their codes are given in another column. But the given codes are not in the same order of words given. Candidates are required to find out the codes of words on the basis of comparison of their properties, traits etc.

Example 1.10: In the given table, some words are given in Column I and their codes are given in Column II. The code of the words given in Column II are not given in the order of given words. Find the corresponding codes of words and answer the following question.

Column I	Column II
BAT	dead
WIFE	dip
GREAT	sector
NATURE	training
TERMINAL	right

Find the code for the word 'GREAT'

Solution:

As in Column I 'GREAT' is the only word having five letters and in Column II 'right' is the only word having five letters. Therefore, code for 'GREAT' is 'right'.

CHECK YOUR PROGRESS 1.9:

Directions (Q. Nos. 1-5) Read the following information to answer the questions that follow, In Column I, some words are given. In Column II, their codes are given and they are arranged in the same order in which they are in Column I but the letters in the code in Column II are not in the same order in which the letters of the words are given in Column I. Study the columns and give your answer on the basis of that.

Column 1	Column II
(1) FLOUR	(A) x n c a p
(2) T A P	(B) ksd
(3) ROSE	(C) c m r n
(4) L 0 T U S	(D) smcpx
(5) SAIL	(E) k p t m

1. Find the code for F.

2. Which letter is the code for P?

3. Find the code for L

4. What is the code for E?

5. Which of the following options is the code for 0?

 # # Answers are given at the end of the document.

SUMMARY:

- Coding can be done by Rearrangement of Letters
- Coding can be done by Replacement of Letters
- Coding can be done by Opposite Letters Coding
- Coding of Letters by Their Left and Right Letters
- Coding can be done by Number Coding
- Coding can be done by Symbol Coding Based on Similarity
- Coding by Substitution/Word Replacement
- Coding can be done by Fictitious Language Coding
- Coding can be done by Comparison

1.10 Glossary:

Fictitious:- not real or true; imaginary or fabricated.

1.11Suggested Readings:

- Quantitative Aptitude for Competitive Examinations by R.S.Agarwal. Published by S. CHAND
- Study material for CAT, SAT, GRE, GMAT by TIME, CareerLauncher and IMS etc.
- Quantitative Aptitude by Pearson Publications

1.12 Practice exercise:

1. If 'PARK' is coded as '5394', 'SHIRT' is coded as '17698' and 'PANDIT' is coded as '532068', how would you code 'NISHAR' in that code language?
   (a) 266734 (b) 231954 (c) 201739 (d) 261739

2. If in a certain code language, '0' is written as 'E', 'A' as 'C', 'M' as 'I', 'S' as 'O', 'N' as 'P', 'E' as 'M', T as 'A', 'P' as 'N' and 'C as 'S , then how will 'COMPANIES be written in that code language?

(a) SEIACPAMO (c) SEINCPAMO (e) None of these

3. In a certain code language 'TREAD' is written as '7%#94' and 'PREY' is written as '$%#8'. How is 'ARTERY' written in that code?

(a) 9#7%#8 (c) 9%7#%8 (b) 9#%7#8 (d) 9%#7%8

4. If '6' is coded as T, '8' is coded as T, '3' is coded as 'N', '9' is coded as 'Q', '2' is coded as Y, '5' is coded as 'D' and '7' is coded as 'R', then what is the uncoded form of 'DRINTQ'?

(a) 573869 (b) 578396 (c) 576839 (d) 578329 (e) None of these

5. If in a certain coded language, UNCLE is written as 94672, SISTER is written as 535821 and SON is written as 584, then what will be the code of NOISE in that coded language?

(a) 64825 (b) 84652 (c) 46356 (d) 48352

6. In a certain code language 'TRAIN' is written as '39*7%' and 'MEAL' is written as '4$^@'. How is 'REAM' written in that code language?

(a)3$J>9 (b) 74 $ 9 (c) 4*$ 9 (d)9$>4

7. In a certain code language 'BEAUTIFUL' is coded as '573041208', 'BUTTER' as '504479'. How is 'FUTURE' coded in that code language?

(a) 201497 (b) 204097 (c) 704092 (d) 204079

8. In a certain code MOAN is written as 5%3$ and NEWS is written as $1@8. How is SOME written in that code?

(a) 8% 51 (b)85%8 (c)8@51 (d)8%31

9. In a certain code language 'BASKET' is written as '5$3%#1' and 'TRIED' is written as '14*#2'. How is 'SKIRT' written in that code language? (a)3%*41 (b) 3*%41 (c) 3% #41 (d) 3#4%1 (e) None of these

10. In a certain code language 'ROAM' is written as '5913' and 'DONE' is written as '4962'. How is 'MEAN' written in that code language?

(a) 5216 (b)3126 (c)3216 (d)9126 (e) None of these

11. In a certain code language 'DINE' is writttten as '1537' and 'WORTH' is written as '$#96@'. How is 'WITHER' written in that code lanugage?

(a) $5@679 (b) $567@9 (c) $56@79 (d) $56@97

12. In a certain code language 'ROPE' is written as '%57$', 'DOUBT' is written as '35#8*' and 'LIVE' is written as '@24$'. How is 'TROUBLE' written in that code language?

(a) ★%5#8@$ (b) ★%#58@$ (c) ★%5#8@4 (d) ★%#58$@ (e) None of these

13. If 'GERMAN' is coded as 126534, 'FOOD' is called as 9770 and CORN is coded as 8T64, then what will be the code for 'FRANCE'?

(a) 961063 (b) 963482 (c) 963428 (d) 964382

14. If 'LION' is called 'TIGER', 'TIGER is called 'DOG' 'DOG' is called 'ASS', 'ASS' is called 'BIRD', 'BIRD' is called 'CUP', 'CUP' is called 'PLATE', then which of the following does fly in the sky?

(a) ASS (b) LION (c) CUP (d) BIRD

15. If 'PARROT' is called 'SPARROW', 'SPARROW' is called 'CROW', 'CROW' is called 'DUCK', 'DUCK' is called 'COW ', 'COW' is called 'PIGEON' and 'PIGEON' is called 'CUCKOO', then which of the following has four legs?

(a) COW (b) PIGEON (c) CUCKOO (d) DUCK

16. If 'DOG' is called 'CAT', 'CAT' is called 'FOX', 'FOX' is called 'SNAKE', 'SNAKE' is called 'MONKEY'; 'MONKEY' is called 'OX' and 'OX' is called 'HORSE', then which of the following is a reptile?

(a) FOX (b) SNAKE (c) MONKEY (d) OX

17. If 'water' is called 'food', 'food' is called 'tree', 'tree' is called 'sky', 'sky' is called 'wall', on which of the following does a 'fruet' grow?

(a) Water (b) Food (c)Tree (d)Sky

18. If 'TELEVISION' is called 'CALCULATER', 'CALCULATER' is called 'PEN', 'PEN' is called 'BOOK', 'BOOK' is called 'PILLOW', 'PILLOW' is called 'BED', then what do we use to write?

(a) CALCULATER (b) PEN (c) BOOK (d) PILLOW

19. If 'RAT' is called 'CAT', 'CAT' is called 'DOG', 'DOG' is called 'LION', 'LION' is called 'COW', 'COW' is called 'FOX', 'FOX' is called 'ASS', then which of the following animal roars?

(a) FOX (b) LION (c) CAT (d) COW

20. If 'BLACK' means 'PINK', 'PINK' means 'BLUE', 'BLUE' means 'WHITE', 'WHITE' means 'YELLOW', 'YELLOW' means 'RED' and 'RED' means 'BROWN'. Then, what is the colour of clear sky?

(a) Blue (b) Pink (c) White (d) Brown

ANSWERS:

CHECK YOUR PROGRESS 1.1

1. (a) REGNIFYDAL (b) AEPYLR (c) FIGTH
2. (a) OMTHER (b) MEHTOR (c) RTEHA

CHECK YOUR PROGRESS 1.2

1. (a) OKEMA (b) AKDMC
2. (a) UCDI (b) BXLNZ

CHECK YOUR PROGRESS 1.3

1. (a) RASHMI (b) SNAKE
2. (a) OLGFH (b) VMRSH

CHECK YOUR PROGRESS 1.4

1. RTTVMO
2. MONPSUDF
3. MOTVFH
4. ZBBDSU
5. SUZBKMJL

CHECK YOUR PROGRESS 1.5

1. 1169121
2. 3478
3. 4516
4. 4561

5. 2189141012

CHECK YOUR PROGRESS 1.6

1. 3*$5
2. *@56
3. #★%?
4. ★%5#8@$
5. 3%*41

CHECK YOUR PROGRESS 1.7

1. Colour of ‘Lady Finger’ is green but here green is called yellow. Hence, colour of ‘Lady Finger’ is yellow.

2. ‘Lion’ is a wild animal but here ‘lion’ is called ‘buffalo’. Hence, in this case ‘buffalo’ is a wild animal.

3. Train’ is associated with ‘railways’ but here train is called ‘aeroplane’. Hence, in this case ‘aeroplane’ is associated with railways.

4. Colour of grass is ‘green’ but here ‘green’ is called ‘blue’. Hence, in this case colour of ‘grass’ is ‘blue’.

5. Children study in ‘school’ but here ‘school’ is called ‘house’. Hence, in this case ‘house’ is the place where children go to study.

CHECK YOUR PROGRESS 1.8

1. ga
2. la
3. ko or po
4. pa
5. pi

CHECK YOUR PROGRESS 1.9

1. a
2. d
3. p
4. r
5. c

Practice exercise 1.12

1. d
2. c
3. c
4. e
5. d
6. d
7. b
8. a
9. a
10. c
11. c
12. a
13. b
14. c
15. b
16. c
17. d
18. c
19. d
20. c