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Q. 2. given that -

Initial LZW Dictionary :

Index	Entry
1	a
2	b
3	r
4	t

The LZW output sequence of encoder -

3, 1, 4, 6, 8, 4, 2, 1, 2, 5, 10, 6, 11, 13, 6

Sol: 1.) The decoder starts with index value 3 which correspond to letter 'r', so we decode the first element of our sequence.

2.) The next decoder input is 1, which is the index corresponding to letter a, we decode an 'a' and concatenate it with our current pattern to form the pattern 'ra' 'ra' does not exist in the dictionary, so we add it as fifth element of the dictionary.

3.) Similarly, we get a new dictionary until index 13, which as follows -

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Index	Entry
1	a
2	b
3	r
4	t
5	ra
6	at
7	aa
8	ab
9	rb
10	bt
11	bta
12	btb
13	bb

Sequence after decoding is :

"a b r t ra at a a ab rb bt bta btb bb"