$$C(x) = C^{(1)}(x^n) + xC^{(2)}(x^n) + x^2C^{(3)}(x^n)$$

$$= C^{(1)}(x^3) + xC^{(2)}(x^3) + x^2C^{(3)}(x^3)$$

$$= 1 + x^{12} + x^{15} + x^{18} + x\{1 + x^3 + x^{12} + x^{21}\} + x^2\{1 + x^6 + x^9 + x^{18} + x^{21}\}$$

$$= 1 + x^{12} + x^{15} + x^{18} + x + x^4 + x^{13} + x^{22} + x^2 + x^8 + x^{11} + x^{20} + x^{23}$$

$$= 1 + x + x^2 + x^4 + x^8 + x^{11} + x^{12} + x^{13} + x^{15} + x^{18} + x^{20} + x^{22} + x^{23}$$

$$C = [111,010,001,001,110,100,101,011]$$

* STATE DIAGRAM & CODE TREE:-

P) Considers the binary convolution encodes shown in the figure. Draw the state table, state transition table, state diagram & corresponding code tree. Using the code tree, find the encoded sequence for the message 10111.

$$C(x) = C^{(1)}(x)^7 + x.C^{(2)}(x)^7$$

$$= C^{(1)}(x)^2 + x \cdot (C^{(2)}(x)^2$$

$$= \{1+x+x^2+x^3+x^6\}^2 + x\{1+x^2+x^3+x^4+x^5+x^6\}^2$$

$$= 1+x^2+x^4+x^6+x^{12} + x+x^5+x^7+x^9+x^{11}+x^{13}$$

$$= 1+x^3+x^2+x^4+x^5+x^6+x^7+x^9+x^{11}+x^{12}+x^{13}$$

$$C = [1110111101011 1]$$

$g^{(1)} = 110$

$g^{(2)} = 101$

$g^{(3)} = 111$

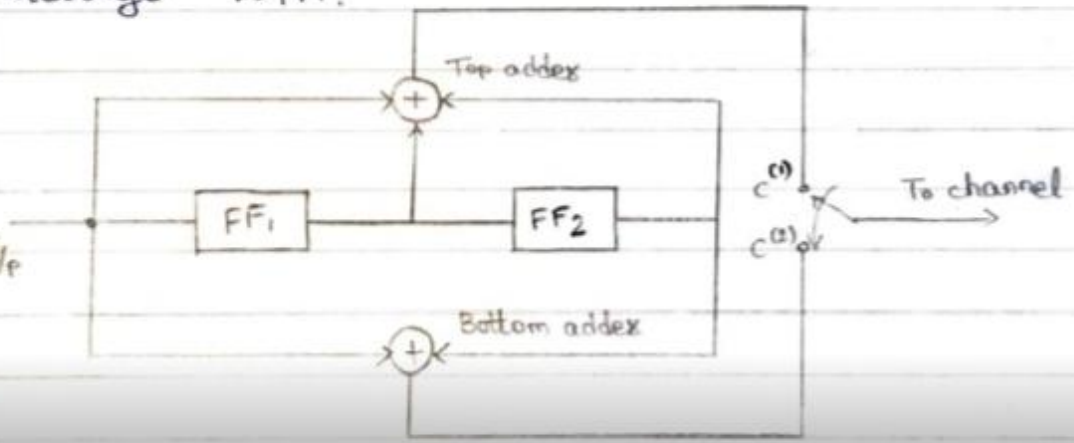
$d = 111101$

$q^{(1)}(x) = 1+$

$$c = [111,010,001,001,110,100,101,011]$$

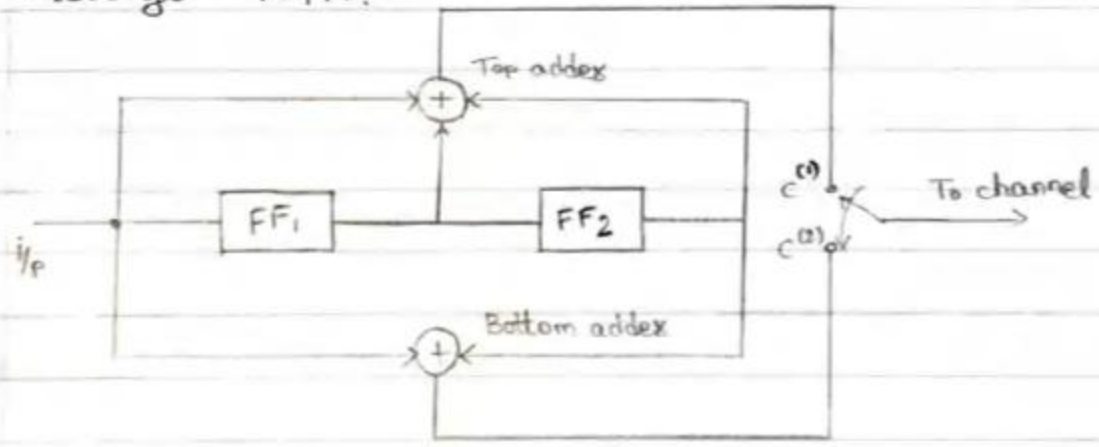
* STATE DIAGRAM & CODE TREE:-

P) Consides the binary convolution encodes shown in the figure. Draw the state table, state transition table, state diagram & corresponding code tree. Using the code tree, find the encoded sequence for the message 10111.



State table :-

table, state diagram & corresponding code tree. Using the code tree, find the encoded sequence for the message 10111.



State table :-

$S_0 \leftarrow 00$

$S_1 \leftarrow 01$

$S_2 \leftarrow 10$

$S_3 \leftarrow 11$

State transition table :-

Present state	Binary	input	Next state	Binary description	$d_1 d_{k-1} d_{k-2}$	$c^{(1)} c^{(2)}$
S_0	00	0	S_0	00	000	00
		1	S_2	10	100	11
S_1	01	0	S_0	00	001	11
		1	S_2	10	101	00
S_2	10	0	S_1	01	010	10
		1	S_3	11	110	01
S_3	11	0	S_1	01	011	01
		1	S_3	11	111	10

Present state	Binary	input	Next state	Binary description	$d_i d_{i-1} d_{i-2}$	$c^{(1)} c^{(2)}$
S_0	00	0	S_0	00	000	00
		1	S_2	10	100	11
S_1	01	0	S_0	00	001	11
		1	S_2	10	101	00
S_2	10	0	S_1	01	010	10
		1	S_3	11	110	01
S_3	11	0	S_1	01	011	01
		1	S_3	11	111	10

Code

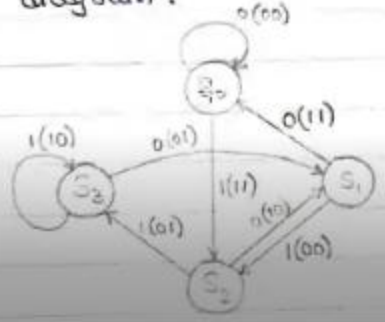
0 → Upper di

1 → Dowbard d

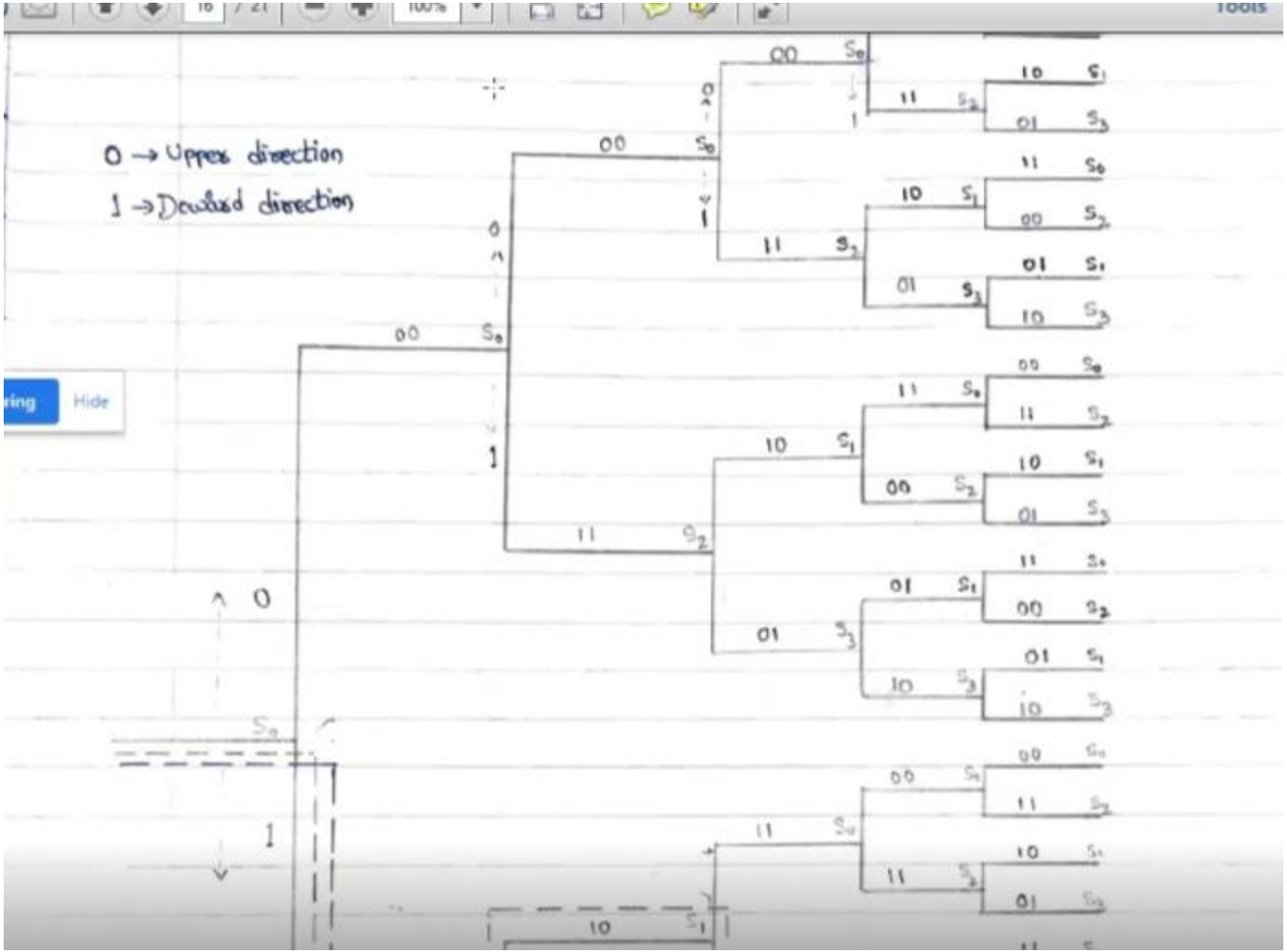
$$c^{(1)} = d_i + d_{i-1} + d_{i-2}$$

$$c^{(2)} = d_i + d_{i-2}$$

State diagram :




Code tree :-
0 → Upper direction
1 → Downward direction
meet.google.com is sharing your screen
Stop sharing
Hide


0 → Upper direction
1 → Downward direction
Hide