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4(a)

P_1	P_2	P_3	P_4	P_5	P_6	P_7
0	1	1	0	0	1	1

Now, P_1 |01| (even) = 0
P_2 |11| (odd) = 1
P_4 011 (even) = 0

@ hamming code is 1100110

At recievers end code is 0110001

P_1	P_2	D_3	P_4	D_5	D_6	D_7
0	1	1	0	0	0	1

$C_1 = P_1 (+) D_5 \oplus D_7$

$= 0 \oplus 1 \oplus 0 \oplus 1 = 0$

$C_2 = P_2 (+) D_3 \oplus D_6 \oplus D_7$
$= 1 \oplus 1 \oplus 0 \oplus 1 = 1$ (error)

$C_4 = P_4 0 \oplus D_5 \oplus D_6 \oplus D_7$
$= 0 \oplus 0 \oplus 0 \oplus 1$
$= 1$ (error)

$C_4 C_2 C_1 = 110$ 6th position

∴ At 6th position there is error
Do error

The Corrected code will be 0110011

Corrected data is 1011.

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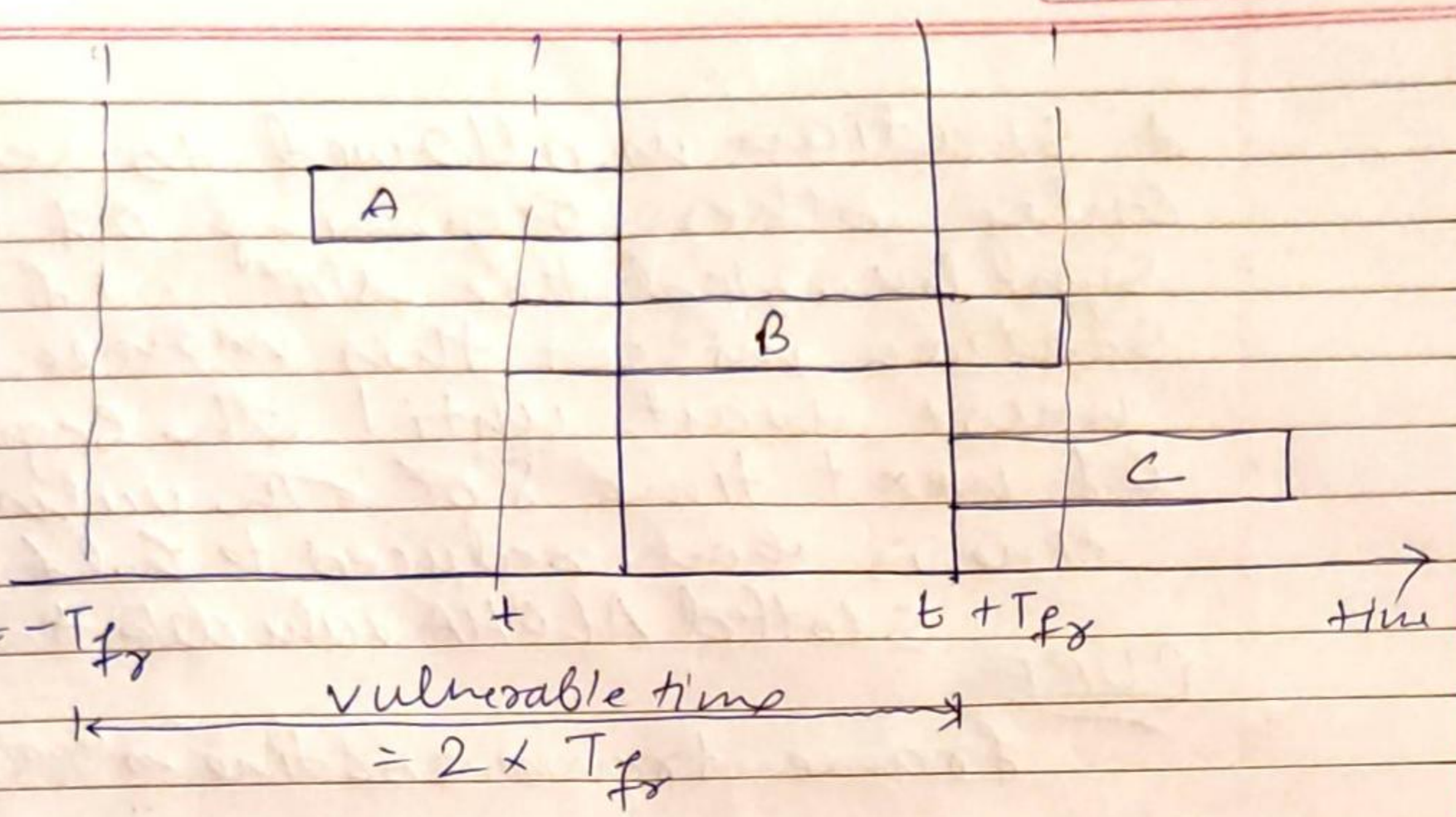
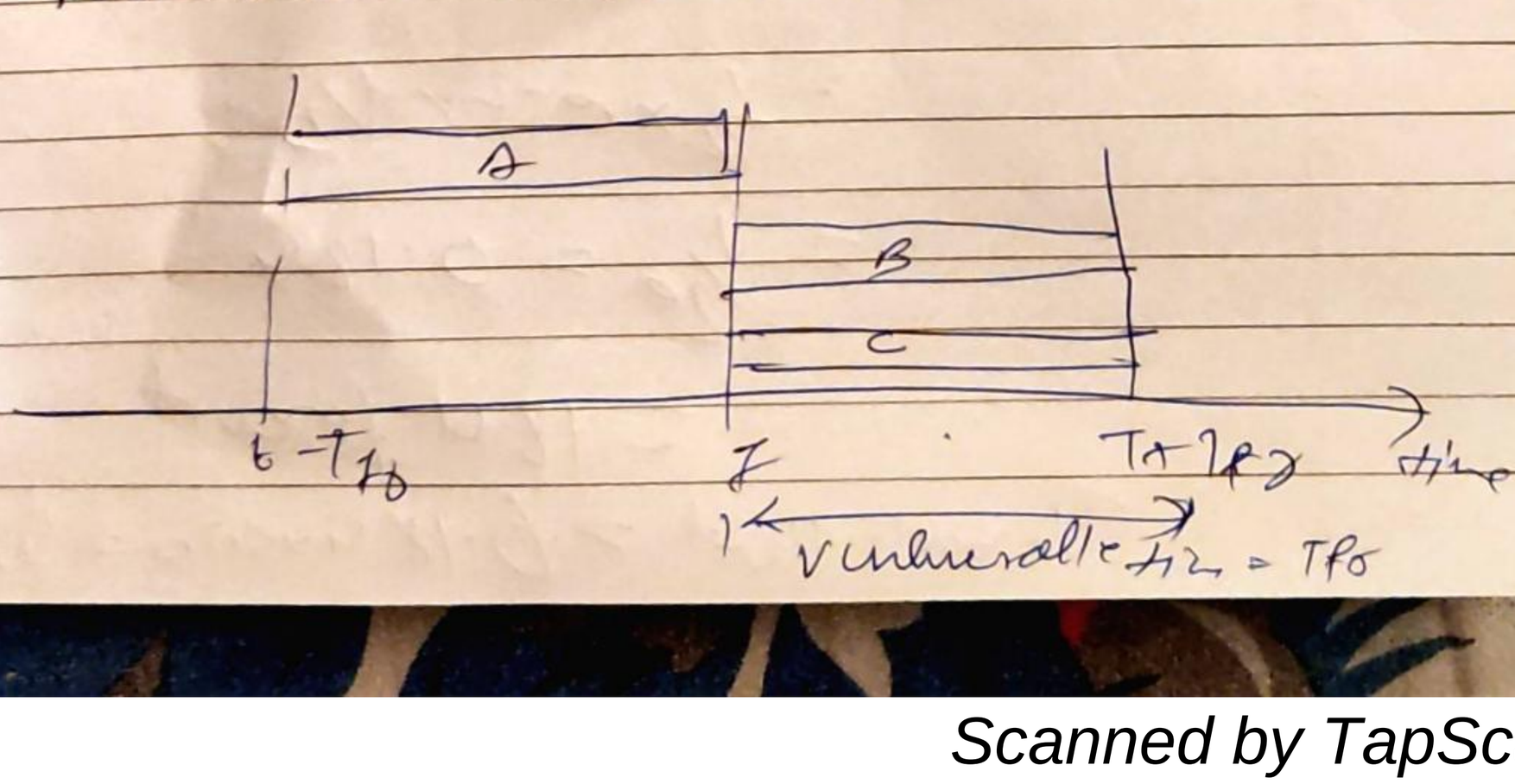
(b)



Station B starts to send a frame at time t. No lets imagine that Station A has started to sends frame after t - Ifr. This bads to collision b/w the frames from Station B & A.

Now suppose station C starts to send a frame before time t + Tfr. ~~This~~ there is also a collision b/w station B & C.

~~Vul~~ Vulnerable time, during which a collision may occurs in pure ALOHA is 2 time the frame transmission time.
pure ALOHA Vulnerable time = 2 × Tfr



A station is allowed to send it only at the beginning of the synchronized time slot. if a station misses this moments, it must wait until the beginning of next time slot. The vulnerable time is now reduced to half equal to Slotted ALOHA vulnerable time = Tfs

PURE

frame transmisson time is 400/400 = 1ms

(a) 1000 frams per second, i.e. 1 Frame per milised

Then $G = 1$

$S = G \times e^{-2G}$

$= 1/e^2$

$= 0.135$ (13.53 percent)

Throughput = 1000×0.135

$= 135$ //

(b) 500 frames

$S = G \times e^{-2G}$

$= 1/2 \times e^{-2} \times 1/2$

$= 1/2e = 0.184$

$= 18.4$ percent

Throughput = $0.184 \times 500 = 92$

(c) 250 frames

$G = 1/2t$

$S = G \times e^{-2G}$

$= 1/4e$ Hz

$= 0.152$ (15.2 percent)

Throughput $= 250 \times 0.152$

$= 38$

SLOTTED

Arrival is 40/sec

(a) $a = 1$

$S = G \times e^{-G}$

$= 0.368$ (36.8%)

Throughput $= 1000 \times 0.368$

$= 368$

(b) $G = 1/2$

$S = G \times e^{-G}$

$= 0.303$ (30.3%)

Throughput $= 500 \times 0.303$

$= 151$

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(c) $h = 1/4$

$S = G * e - G$

$= 1/4 e^{1/4}$

$= 0.195$

Throughput $= 0.195 \times 256$

$= 49$ //