PCM NOTE:

Sampling: A train of narrow rectangular pulses are used to sample the message signal.

Sampling frequency fs must be greater than twice the highest frequency of the message signal ie $fs \geq 2fm$.

Quantization: → Quantizer → approximation or roundingoff

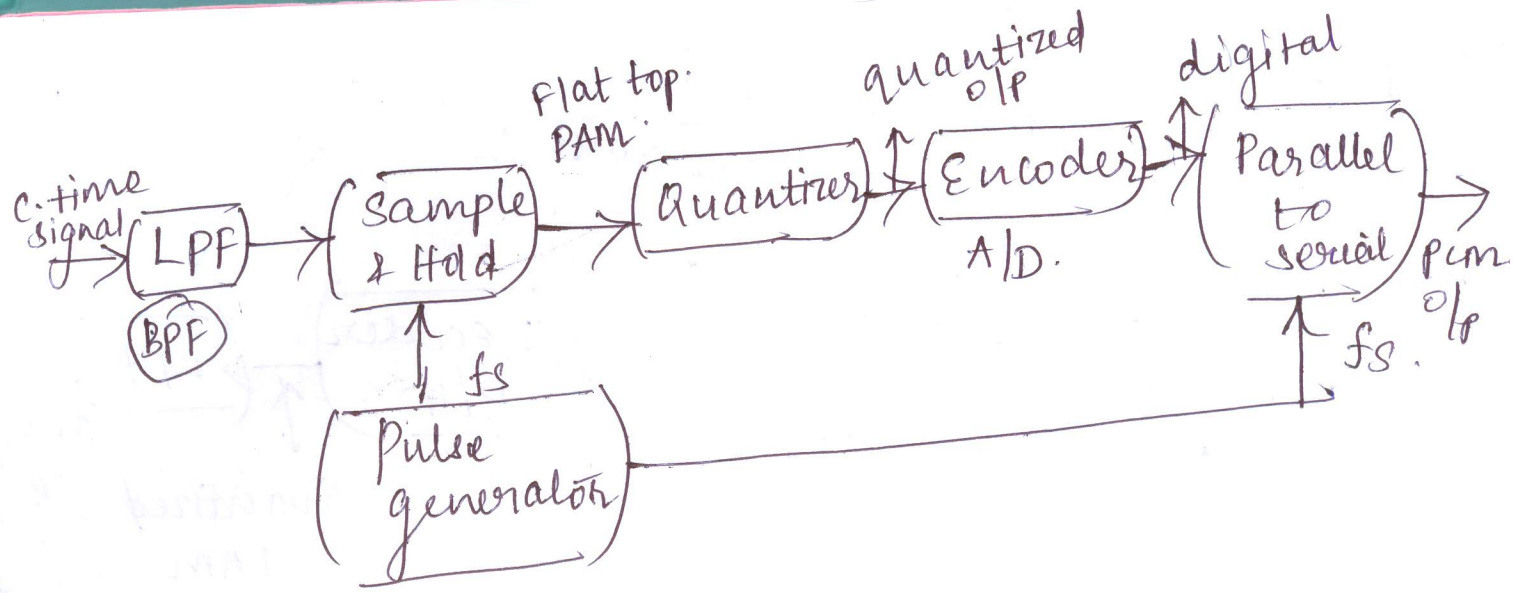
The process of making the signal discrete in amplitude by approximating the sampled signal to the nearest predefined or representation level is called quantization.

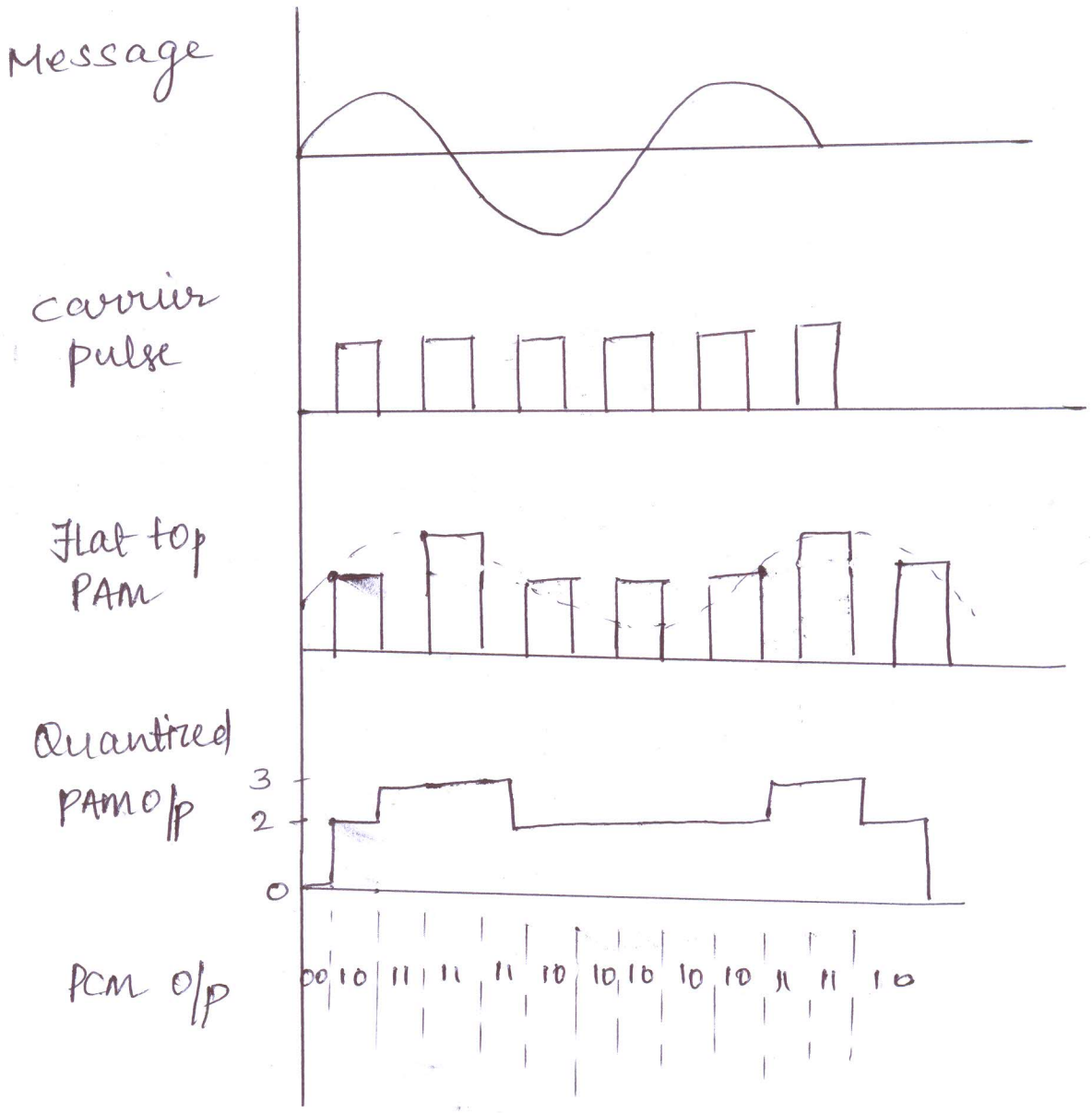
when stepsize between two adjacent level is same throughout the i/p signal range is called uniform quantization.

If the stepsize varies depending on the i/p then ~~the~~ it is known as non-uniform

Encoding: (Encoder:)

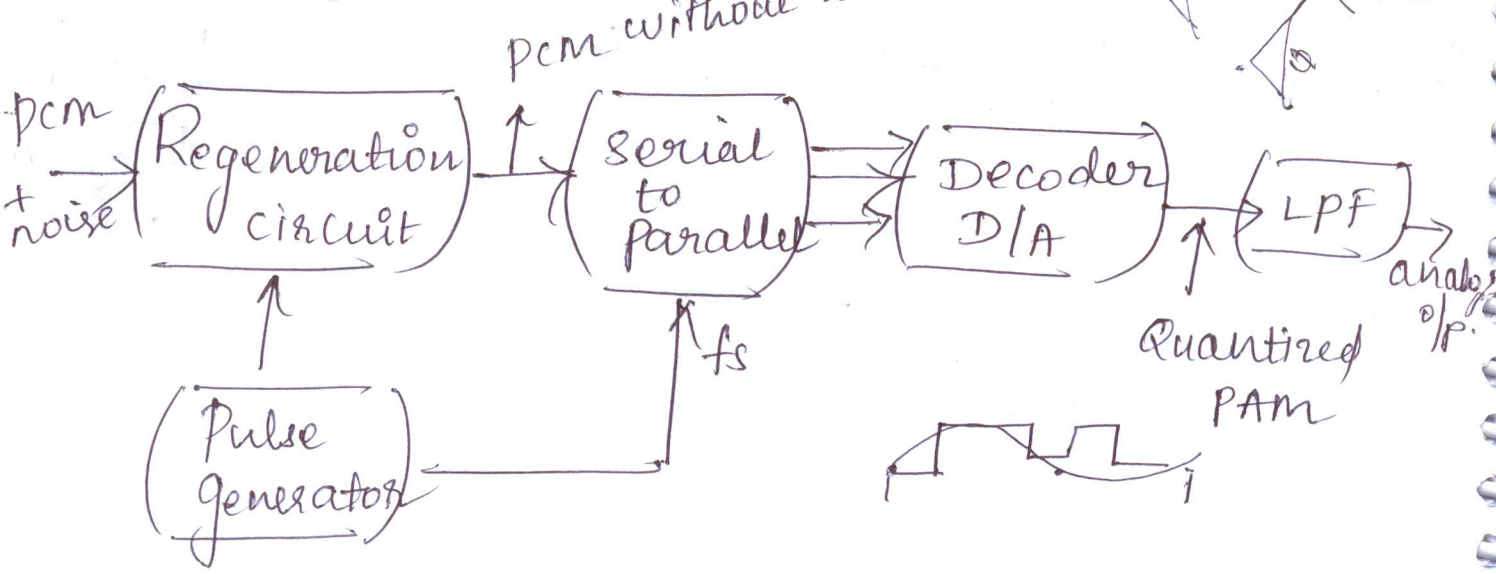
The encoder is used to encode the discrete set of samples. The process of allocating some digital code to each level ~~is called~~ encoding.


c.time signal
LPF
BPF
Sample & Hold
Flat top PAM
Quantizer
quantized o/p
Encoder
A/D.
digital
Parallel to serial
PCM o/p
fs
Pulse generator
fs.


Message
carrier pulse
Flat top PAM
Quantized PAM o/p
3
2
0
PCM o/p
00 10 11 11 11 10 10 10 10 10 11 11 10

421

PCM Decoder / Receiver:



LPF is called as Reconstruction filter and its cut off frequency is equal to message bandwidth.

Signalling Rate :-

It is nothing but the number of bits per second.

No/- of bits per sec = No/- of bits/samples x No/- of samples/sec

Signalling Rate. = $N \times f_s$

$\boxed{N f_s}$.

Transmission Bandwidth:

It is equal to half of the Signalling rate.

$= \frac{1}{2} N f_s$ //.