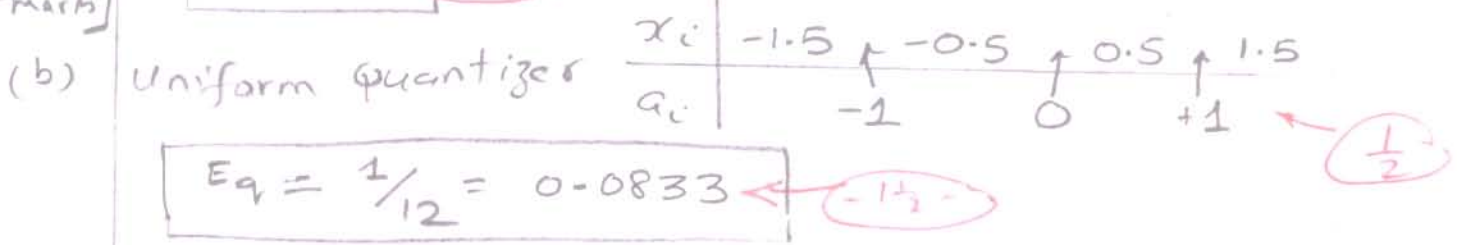
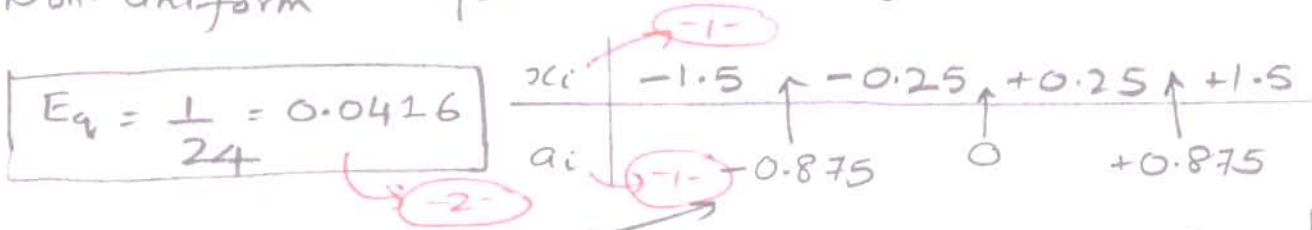


1. [3 marks]  $\left[ \frac{71}{2.5} \right] = 28 \Rightarrow f_s = 2W' = \frac{71}{28} = \boxed{2.5357 \text{ MHz}}$  -3-

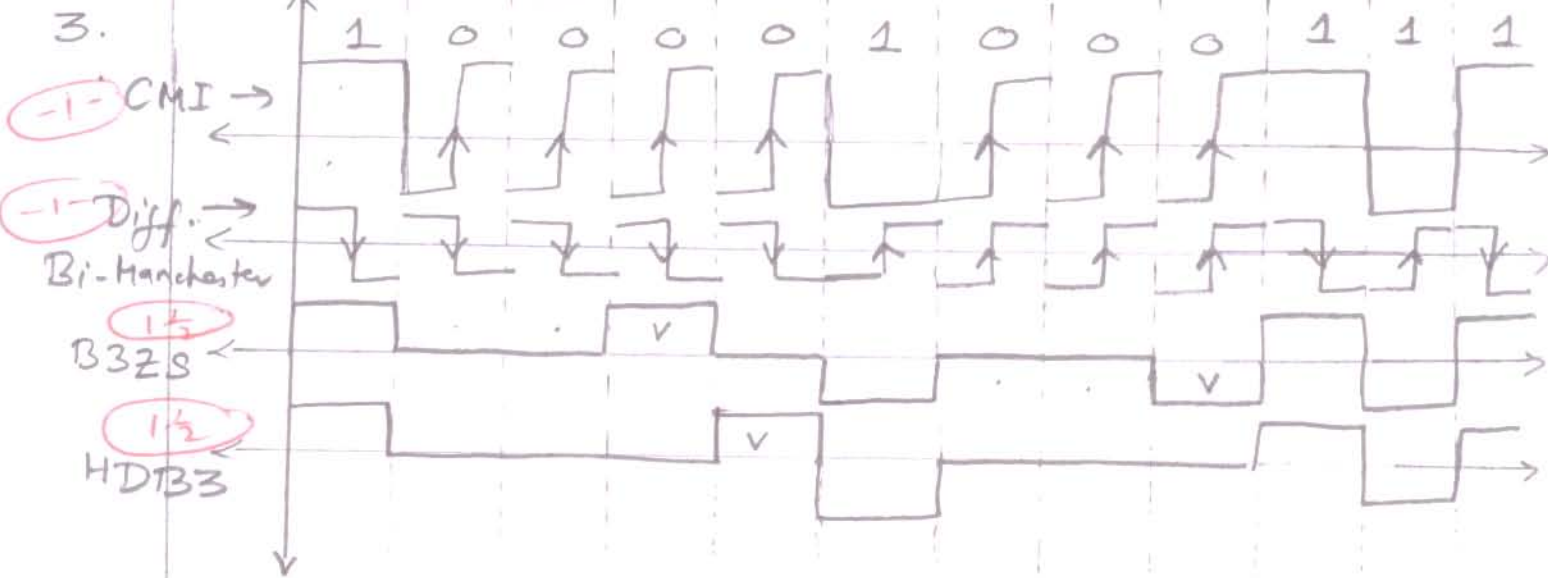
2. [7 marks] (a)  $\alpha = \frac{2}{3}$  -1-



(c) Non-uniform "Lloyd-Max" quantizer



Note: in this case, 1-step convergence!



4.

- 1- (i) False  $\rightarrow$  EC is computationally more complex than ES
- 1- (ii) False  $\rightarrow$  slope-overload noise is caused due to rapid fluctuation (or granular noise is caused due to quantization error)
- 1- (iii) False  $\rightarrow$  CELP is a model based coder (vocoder)
- 1- (iv) False  $\rightarrow$  AMI is less power efficient than Diff. Manchester
- 1- (v) False  $\rightarrow$  4 additional bits  $\Rightarrow +6 = 24 \text{ dB} \uparrow \text{SNR}$