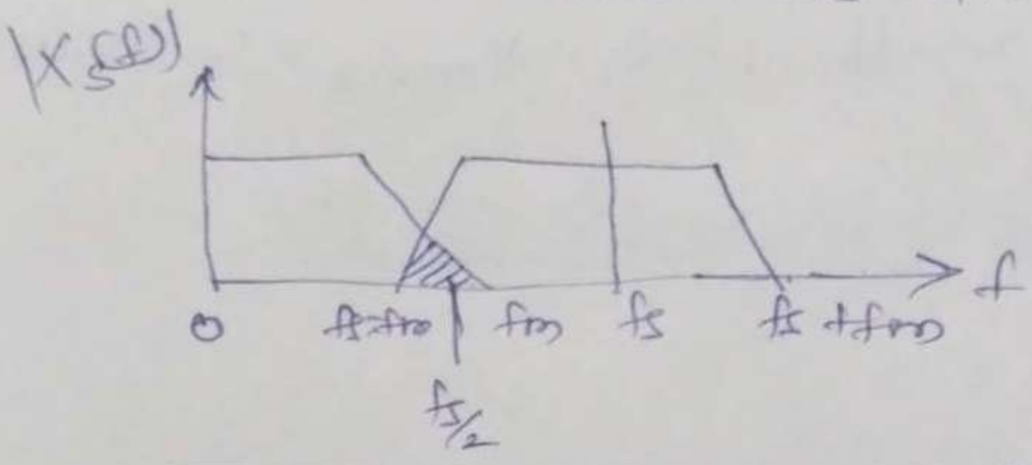
Part-A

1. If the sampling condition is not met aliasing will occur. The spectrum will be



2. sampling freq

$x(t) = 3\cos(50\pi t) + 10\sin(300\pi t) - \cos(100\pi t)$

F_1 F_2 F_3.

$F_1 = 25Hz$, $F_2 = 150Hz$, $F_3 = 50Hz$.

from

sampling freq should be $f_s > 300Hz$.

3. As became of its Periodic nature. we can have the freq range from 0 to $f_s/2$.

4. a. True

b. False

c. False.

5. $x_a(t) = A\cos(2\pi Ft + \phi)$, $-\infty < t < \infty$ is continuous-valued signal.

→ A signal takes all possible values on a finite (or) an infinite range is said to be continuous valued.

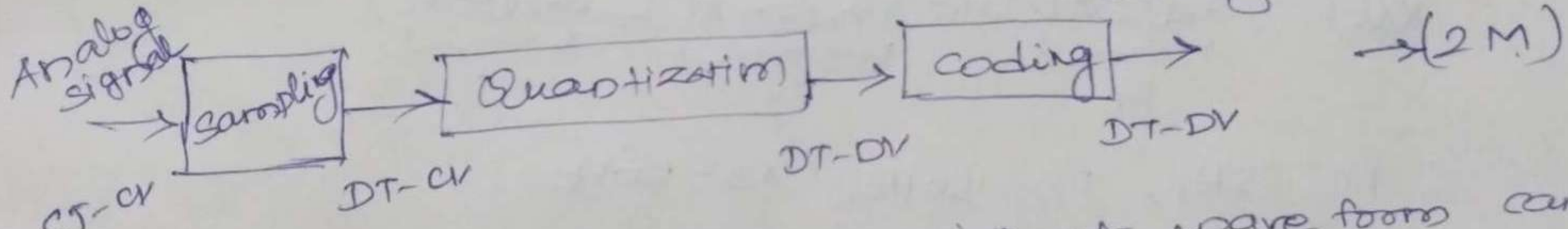
6). Quantization will not improve the qty of the data.
As because it will introduce quantization error $e_q(n)$ there by ↓ the accuracy of data.

7) Quantization step size. $m=4$, $L=16$, $x_{max}=1$, $x_{min}=0$.

$$\Delta = \frac{1}{15} = 0.0667.$$

Part-B.

8. ADC Techniques:-



Explanation of each with or without waveforms can be given 8 marks.

9. $f_s > 2f_m$: over sampling.
→ sampling above the minimum Nyquist rate is over sampling.
→ It reduces demands on anti-aliasing filter as it introduces space in the spectrum.
→ with an example spectrum and we can give full marks.