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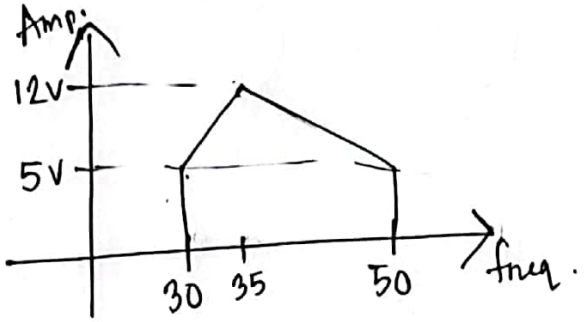
Quiz-2

1. a) Bandwidth = $f_h - f_l$

$\Rightarrow f_l = f_h - \text{Bandwidth} \Rightarrow 50 - 20 = 30$ KHz.

b)



2. Propagation Delay = $\frac{\text{Distance}}{\text{Speed}} = \frac{5000\text{ km}}{200{,}000\text{ km/s}} = 0.025\text{s}$

Transmission Delay = $\frac{\text{Total Size}}{\text{Bandwidth}} = \frac{20\times40\times90\times8}{15\times10^6} = 0.0384\text{s}$

Processing Delay = (4×3) ms = 12ms = 12×10^{-3}s

Queuing Delay = (5×4)ms = 20ms = 20×10^{-3}s

Total Delay = $(0.025 + 0.0384 + 12\times10^{-3} + 20\times10^{-3})$s

= 0.0954s = 95.4 ms

3. a) $C = 5\times10^6 \times \log_2(1+100) = 33.29$ Mbps

b) $C' = C \times 0.6 = 33.29 \times 0.6 = 19.974$ Mbps

$C' = 2 \times B \times \log_2 L$

$\Rightarrow \log_2 L = \frac{C'}{2B} = \frac{19.974}{2\times5} = 1.99 \approx 2$

$\Rightarrow L = 2^2 = 4$

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4. $P_2 = 10 - (5 \times 1) = 5W$

$$\text{Att.} = 10\log_{10}\frac{P_2}{P_1} = 10\log_{10}\frac{5}{10} = -3.01\,dB$$

5.