Date

Muchammad Daniyal Kautsar
21/479067/TK/52800

1. A at what F constructive interference occurs at point A.

$$\frac{dP}{L} = \left(m - \frac{1}{2}\right)\frac{V}{F}$$

$$\frac{12.6}{5} = \left(-1 - \frac{1}{2}\right)\frac{340}{F}$$

$$F \approx -35,4167 \text{ Hz}$$

B.

$$\frac{dP}{L} = m\lambda$$

$$\frac{12.6}{5} = \frac{V}{F}$$

$$\frac{12.6}{5} = \frac{340}{F}$$

$$F = 23.61 \text{ Hz}$$

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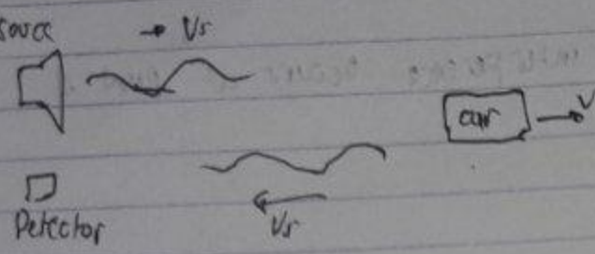
2.



A. Which signal has higher f?

f_t = transmitted signal
f_r = received signal
f_c = singnal at car

* $F_c = \frac{V_s - V}{V_s} \times F_t \rightarrow F_t = \frac{V_s}{V_s - V} \cdot F_c$

* $F_r = \frac{V_s}{V_s + V} \times F_c$

* $\frac{F_t}{F_r} = \frac{\frac{V_s \cdot F_c}{V_s - V}}{\frac{V_s \cdot F_c}{V_s + V}} \Leftrightarrow \frac{F_t}{F_r} = \frac{V_s + V}{V_s - V}$

A. F_t will be greater than F_r.

B. Estimate v. interm of f_t, f_r, V_s

$F_t = \frac{V_s}{V_s - V} \cdot F_c \Rightarrow F_c = \frac{V_s - V}{V_s} \cdot F_t$

$F_r = \frac{V_s}{V_s + V} \cdot F_c$

substituting and we get

$f_r = \frac{V_s}{V_s + V} \cdot \frac{V_s - V}{V_s} \cdot F_t$

$F_c = \frac{V_s - V}{V_s + V} \cdot F_t$

$F_r \cdot V_s + F_r \cdot V = V_s \cdot F_t - V \cdot F_t$

$V(F_r + F_t) = V_s(F_t - F_r)$

$V = \frac{V_s (F_t - F_r)}{F_r + F_t}$

KKY