Physics 231 - 8-Dec-99

- Announcements
- Sound in Pipes
  - Open Pipes
  - Pipes Closed on One End
- Quiz

Sounds in Open Pipes

- Resonant wavelengths when $L = n \ \lambda/2$; n = 1,2,3…
  or
  $\lambda = 2L/n$
- Since $v = \lambda f$; $f_n = v/\lambda = nv/(2L)$; n = 1,2,3...

Pipes Closed on One End

- Resonance when L = $\lambda/4, 3\lambda/4, 5\lambda/4 \ldots (2n+1)\lambda/4$; n = 1, 2, 3…
- $\lambda_n = 4L/(2n+1)$; n = 1, 2, 3…
- $f_n = v/\lambda_n = v(2n+1)/(4L)$

Q1 - Answer = c

Q2 - Problem A - Last name A-K

A pipe, open at both ends resonates at a first harmonic frequency f_{open}. If one end is closed its first harmonic frequency is f_{closed}. How do the two frequencies compare?

A. $f_{open} = f_{closed}$

B. $f_{open} = 2\, f_{closed}$

C. $f_{closed} = 2\, f_{open}$

D. $f_{open} = 3/2\, f_{closed}$

E. $f_{closed} = 3/2\, f_{open}$

Q1 - Answer = c
Q2 - Problem B - Last Name L-Z

- Two pipes, one open on both ends with length L_{open}, the other closed on one end with length L_{closed}, have identical first harmonic resonant frequencies. How do the two lengths compare?

A. $L_{open} = L_{closed}$

B. $L_{open} = 2\ L_{closed}$

C. $L_{closed} = 2\ L_{open}$

D. $L_{open} = 3/2\ L_{closed}$

E. $L_{closed} = 3/2\ L_{open}$