Assignment_3

The due date for submitting this assignment has passed.

Due on 2021-02-10, 23:59 IST.

As per our records you have not submitted this assignment.

1) A loudspeaker source produces a sound pressure level (SPL) of 60 dB at a certain location, and a second *identical* loudspeaker source placed well-within a wavelength distance from the first source is turned on. What is the SPL at the same location due to both speakers? ***1 point***

- 66 dB
- 63 dB
- 60 dB
- 69 dB

No, the answer is incorrect.
Score: 0
Accepted Answers:
66 dB

2) Two diesel engines are radiating noise. The SPL at a particular location due to the first engine is 75 dB while the SPL due to the other engine at the same location is 73 dB. The resultant SPL (in dB) at the same location is approximately given by ***1 point***

- 73 dB
- 77 dB
- 80 dB
- 76 dB

No, the answer is incorrect.
Score: 0
Accepted Answers:
77 dB

3) Consider a circular duct of radius *a* flush-mounted to a wall and open to the atmosphere. The radiation impedance Z_0 for such a duct at very low-frequencies is given by ***1 point***

- $Y_0\left(0.5k_0^2a^2 + j0.85k_0a\right)$,
- $Y_0\left(0.5k_0^2a^2 + j0.6k_0a\right)$,
- Y_0
- $Y_0\left(j0.85k_0a\right)$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$Y_0\left(0.5k_0^2a^2 + j0.85k_0a\right)$,

4) For the above case, the expression for first resonance frequency f_n of the duct with length l is given by ***1 point***

- $\frac{c_0}{2(l+0.6a)}$
- $\frac{c_0}{2(l+0.85a)}$
- $\frac{c_0}{2l}$
- $\frac{c_0}{l}$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$\frac{c_0}{2(l+0.85a)}$

5) In an electro-acoustic analogy, a side-branch resonator is often represented as a ____ element? ***1 point***

- shunt
- in-line
- depends on the circuit
- end-load

No, the answer is incorrect.
Score: 0
Accepted Answers:
shunt

6) At low frequencies, a small tube of a short length sandwiched between two large volumes acts as a ***1 point***

- lumped inertance
- lumped compliance
- damper
- cannot say

No, the answer is incorrect.
Score: 0
Accepted Answers:
lumped inertance

7) Consider a Helmholtz Resonator (HR) having a cavity of volume V_c neck length l_n, cross-section area of the neck S_n and wall-thickness of the neck t_w. The resonance frequency of HR is given by $f_0 = \frac{c_0}{2\pi}\sqrt{\frac{S_n}{l_{eq}V_c}}$, where the equivalent length $l_{eq} = l_n + t_w + \alpha r_n$, where α is given by ***1 point***

- 1.45
- 1
- 1.7
- 1.2

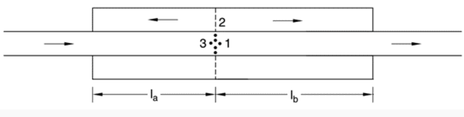
No, the answer is incorrect.
Score: 0
Accepted Answers:
1.7

8) For a quarter-wave resonator, the relation between the length l and the first resonance frequency f_0 is given by ***1 point***

- $l = \frac{c_0}{4f_0}$
- $l = \frac{c_0}{2f_0}$
- $l = \frac{c_0}{f_0}$
- $l = \frac{2c_0}{f_0}$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$l = \frac{c_0}{4f_0}$

9) Consider a concentric hole-cavity resonator shown below: ***1 point***



An expression for the branch impedance Z_2 is given by

- $\frac{1}{n_h}\left\{j\omega\frac{l_{eq}}{S_h} + \frac{\omega^2}{\pi c_0}\right\} - jY_C\frac{1}{\tan k_0l_a + \tan k_0l_b}$
- $\frac{1}{n_h}\left\{j\omega\frac{l_{eq}}{S_h} + \frac{\omega^2}{\pi c_0}\right\} - jY_C\frac{1}{\cot k_0l_a + \cot k_0l_b}$
- $-jY_C\frac{1}{\tan k_0l_a + \tan k_0l_b}$
- $-jY_C\frac{1}{\cot k_0l_a + \cot k_0l_b}$

Here, n_h denotes the number of holes in the circumference of the pipe, Y_c is the characteristic impedance of the annular cavity, l_{eq} and S_h are the equivalent length and cross-sectional area of the hole.

No, the answer is incorrect.
Score: 0
Accepted Answers:
$\frac{1}{n_h}\left\{j\omega\frac{l_{eq}}{S_h} + \frac{\omega^2}{\pi c_0}\right\} - jY_C\frac{1}{\tan k_0l_a + \tan k_0l_b}$