

PHYSICS 198
Exam 4
December 10, 1998

Name _____

Allowed: 3" x 5" card and calculator.
Not Allowed: notebooks and textbooks.

Use a No. 2 pencil and put your NAME and STUDENT SOCIAL SECURITY NUMBER on the scoring sheet.

Choose the most correct answer.

-
1. When the focal cords vibrate, the shape of the graph of time variation of air flow is most similar to
- A) a rectangle.
 - B) a sine wave.
 - C) a triangle.
 - D) a pretzel. (Hint: incorrect answer!)
-
2. The "singer's formant", which allows a singer to be heard above a symphony orchestra, relates to the singer's developing a vocal tract resonance for frequencies in the range of about _____ Hz.
- A) 150-350
 - B) 500-1000
 - C) 2000-3000
 - D) 5000-8000
-
3. In discussing the singer's formant for our class, Professor Simonson described the concept of a "virtual fundamental" in which
- A) soft orchestral music doesn't drown out the singer.
 - B) screeching sounds from sopranos are muted.
 - C) hearing three consecutive overtones creates the illusion of a fundamental.
 - D) one or more consecutive overtones causes the fundamental to disappear.
-

4. The frequencies containing most of the information content in normal human speech are approximately _____ Hz.
- A) 30-300
 - B) 300-3000
 - C) 3000-8000
 - D) 8000-30000
-

5. How much more intense is disco music at 115 DB than the threshold of physiological damage to the human ear which begins at 85 DB?
- A) 10 times more intense.
 - B) 100 times more intense.
 - C) 1000 times more intense.
-

6. Which statement is INCORRECT?
- A) Exposure to loud sound causes a temporary threshold shift in hearing sensitivity that approximately doubles for twice the exposure time.
 - B) When physiological damage to the ear is caused by exposure to loud sounds, hair cells die in the organ of Corti.
 - C) When physiological damage to the ear is caused by exposure to loud sounds, the ear drum is being ruptured.
 - D) Physiological damage to the ear from exposure to loud sound is worst near 3000-4000 Hz.
-

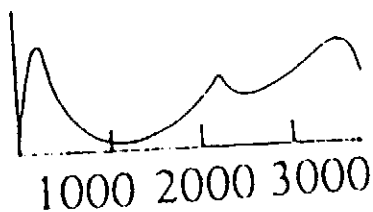
7. The vocal tract is like a pipe with _____ having important "formant" resonance frequencies of _____ for a typical person.
- A) both ends open; 100, 1000, 16000 Hz
 - B) a torus-shaped bagel; more than 50,000
 - C) both ends closed; 5000, 15,000, 25,000 Hz
 - D) one end closed; 500, 1500, 2500 Hz
-

8. The reverberation time is larger for rooms having
- A) smaller volume and less sound absorbing walls.
 - B) larger volume and less sound absorbing walls.
 - C) smaller volume and more sound absorbing walls.
 - D) larger volume and more sound absorbing walls.

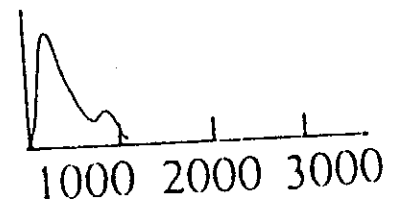
-
9. Anechoic rooms are designed so that inside them there will be no
- A) sound.
 - B) air.
 - C) harmonics.
 - D) reflections.
 - E) banana peels.

-
10. Which of the figures shown most represents the spectrum resulting from speaking the word "hood"?

- A) Figure A.
- B) Figure B.



Hz
Figure A



Hz
Figure B