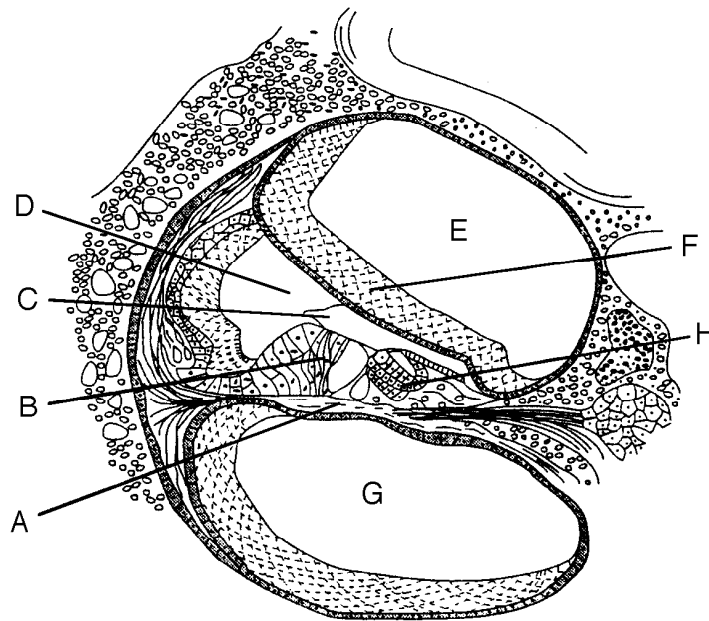


Be sure to use your real student ID# (not some bogus #, SS#, wild name, etc.). I have the class roster with the ID#'s on it, so you can look up your number there if you don't know it. (Jody, we'll have to make up a number for you! ☺) As on the midterm, read each question carefully and answer it completely. Multiple choice questions are worth one point each and other questions are as marked. Use the lined paper to write your answers to the essay questions. Oh, and remember that the exam should only take you 1.5 hours to complete. Good luck on this exam and have a peace-filled vacation. I look forward to seeing you all in 2000.

Essay 1. "Two ears are better than one." Explain how we use the information in our auditory system to localize sounds. Why do we find it difficult to localize pure tones with frequencies (1000-5000 Hz) where pitch perception is quite good? [20 pts]

Essay 2. Vision is often thought of as the primary sense, and has been found to dominate several of the other senses. Clearly describe several instances in which vision dominates or interacts with hearing and touch. [20 pts]



1. Use the figure above to label the parts of the inner ear shown below: [4 pts]
- | | | | |
|-------|---------------------|-------|--------------------|
| _____ | Outer Hair Cells | _____ | Tympanic Canal |
| _____ | Inner Hair Cells | _____ | Cochlear Duct |
| _____ | Reissner's Membrane | _____ | Vestibular Canal |
| _____ | Basilar Membrane | _____ | Tectorial Membrane |

2. Which of the following is *not* true of inner ear hair cell motility?
 - a. Motility is due to the presence of muscle-like actin filaments in the walls of the outer hair cells.
 - b. Motility is the independent elongation and contraction of the outer hair cells.
 - c. Motility is characteristic of inner and outer hair cells.
 - d. Motility may serve to sharpen contours of traveling waves.

3. According to the frequency theory of auditory perception
 - a. the entire basilar membrane vibrates at the same frequency as the tone stimulating it.
 - b. each frequency causes a different part of the basilar membrane to vibrate.
 - c. the eardrum vibrates at the same frequency as the tone stimulating it.
 - d. perception can't occur unless the tone is greater than 2000 Hz.

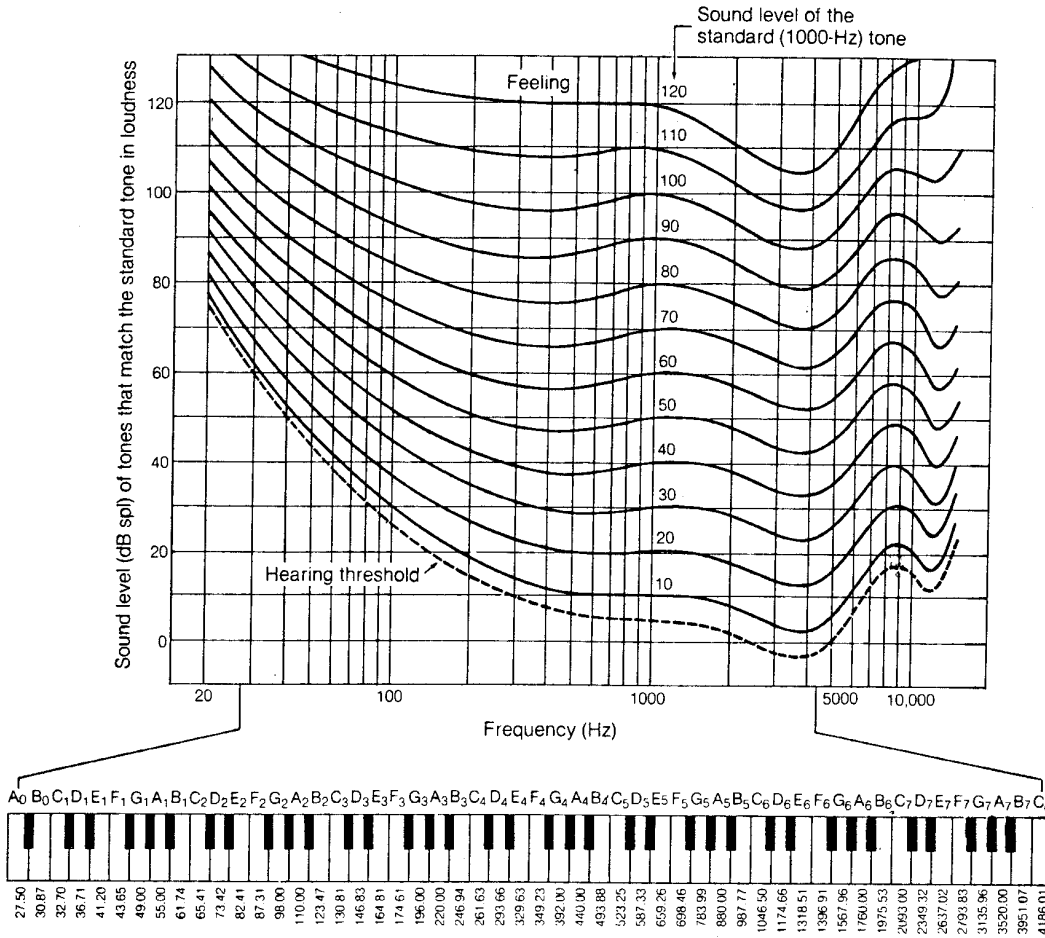
4. According to specificity theory,
 - a. you would feel the warmth of a hot stimulus once another receptor activated your warmth receptor.
 - b. you would feel the warmth of a hot stimulus if the stimulus touched a warmth receptor.
 - c. you would feel the warmth of a hot stimulus if the stimulus touched any receptor.
 - d. None of the above.

5. Suppose that an experimenter takes a tune and greatly increases the size of the pitch intervals in the melody (playing tones in different octaves). You will
 - a. recognize the tune immediately, because of constancy.
 - b. recognize the tune only if it is a familiar one.
 - c. recognize the tune as being familiar, though you will not be able to identify its name.
 - d. not recognize the tune.

6. The radiologists think that an x-ray of region in the lung shows no abnormality, but indeed the region is abnormal. In signal detection terms, they made a
 - a. hit.
 - b. correct rejection.
 - c. false alarm.
 - d. miss.

7. In signal detection theory, the rewards and punishments associated with a particular response are called the
 - a. sensitivity.
 - b. detection threshold.
 - c. criterion.
 - d. payoff.

8. Double pain is
- the amount of pain felt when a person has taken a placebo.
 - the reduction in pain caused by applying a counterirritant.
 - likely due to the speed difference between A-delta fibers and C-fibers.
 - pain perception in an amputated limb.
9. According to Ronald Melzack, the source of phantom limb experience is
- the configuration of neurons called the neuromatrix.
 - severed neurons that remain in the stump of the amputated limb.
 - the transmission cells in the spinal cord.
 - both a & b.
10. It was necessary to add the volley principle to frequency theory in order to explain how frequency is registered, because the frequency theory
- could not explain how we perceive very low notes.
 - could not explain how we perceive tones with frequencies of many thousand cycles per second.
 - could not explain how the middle ear transmitted sound to the inner ear.
 - could not explain how the ear registers complex tones.
11. The tritone paradox results from
- misperception of tone heights.
 - misperception of tone chroma.
 - misperception of the figure-ground relationship.
 - transposition.
12. In research on pain perception, the drug called naloxone
- has the same effects as morphine.
 - counteracts the effects of morphine.
 - makes morphine even more powerful as an analgesic.
 - relieves phantom limb pain.
13. The term *just noticeable difference*
- is important in signal detection theory.
 - refers to the value of the physical stimulus that is just barely detectable.
 - refers to the psychological sensation that corresponds to a change in the physical stimulus that can barely be detected.
 - is the same as the point of subjective equality.
14. An octave represents
- the squaring of the frequency
 - the doubling of the frequency
 - an 1000 Hz gap between two notes
 - a 2000 Hz gap between two notes



15. Using the Fletcher-Munson curves above, answer the following questions: [4 pts]
- Which sound is louder, 80 Hz at 40 dB or 1000 Hz at 10 dB? _____
 - You play music at 30 dB, which frequencies will you not hear? _____
 - Which sound is louder, 1000 Hz at 30 dB or 20 Hz at 80 dB? _____
 - To make a 1000 Hz tone as loud as a 100 Hz tone at 60 dB, it would be at _____ dB.
16. Respondent A gets 40% False Alarms and 50% Hits. Respondent B gets 30% False Alarms and 90% Hits. Which respondent is more sensitive? Why? [2 pts]
17. In signal detection theory, a person with a large d'
- will make many false alarms.
 - is typically trying to detect a very low intensity stimulus.
 - will make more hits than a person with a small d' .
 - is simply guessing.

18. Research on touch perception has revealed
- that Pacinian Corpuscles and rapidly adapting (RA) fibers respond to changes in stimulation to the skin but cease to respond to continuous pressure.
 - that Pacinian Corpuscles in the lower half of the body respond only to changes in skin temperature and not to pressure on the skin.
 - that Pacinian Corpuscles are only sensitive to stimulus onset and are not sensitive to stimulus offset.
 - that continuous signals of pressure on the skin are often ignored by the somatosensory cortex.
19. According to the motor theory of speech perception,
- humans are able to connect the auditory stimuli they hear with the way these sounds are produced by the speaker.
 - the way we perceive speech is analogous to the operation of the motor of a car.
 - babies develop speech perception at about the same time they develop fine motor coordination.
 - we make barely audible noises in our throats when we listen to another person speaking.
20. Passive touch
- refers to repeated skin indentations.
 - occurs when you grope about for the light switch on a dark night.
 - occurs when you place a book on your lap.
 - involves different skin receptors than does active touch.
21. On a cold winter morning, you are anxiously awaiting the arrival of a bus. You are listening intently for the bus's growling engine, but you are hampered somewhat by the muffler you are wearing over your ears. In signal detection terms, you probably have
- increased sensitivity and a relatively low criterion.
 - decreased sensitivity and a relatively low criterion.
 - increased sensitivity and a relatively high criterion.
 - decreased sensitivity and a relatively high criterion.
22. Research on categorical perception has shown that
- categorical perception can be demonstrated in a variety of animals other than humans.
 - categorical perception is limited to speech perception.
 - experimenters have been unable to demonstrate categorical perception for the distinction between voiced and voiceless phonemes.
 - categorical perception cannot be demonstrated for human listeners.

23. In a classic study on phonemic restoration, Warren and Warren cut a phoneme out of a recorded sentence and inserted a coughing sound in the gap. What did the listeners report hearing?
- They accurately reported that the phoneme was missing and the cough was inserted.
 - An additional phoneme seemed to have been inserted, other than the one that had been removed.
 - They could not perceive the cough, even when they were warned that it would be present.
 - They reported that the sentence was intact.
24. In the video on music perception, what was the first vignette (old bells vs. new bells) supposed to illustrate? [2 pts]
25. In the video on bats, what was the problem that faced baby bats setting out to fly for the first time? [2 pts]
26. Adaptation to pain
- does not occur.
 - occurs for all painful stimuli.
 - occurs only for mild pains.
 - occurs only for very painfully hot stimuli.
27. The perceptual systems do not always work in isolation — they often interact. Which of the following *most* supports this statement?
- the McGurk effect
 - phonemic restoration
 - duplex perception
 - transposition

28. What is the function of the eustachian tube?
- It helps the auditory system solve the impedance mismatch problem.
 - It is useful in sound localization.
 - It forms one of the canals in the inner ear.
 - It helps to equalize the air pressure throughout the auditory system.
29. Which of the following statements about the auditory system represents a similarity in the way that the auditory and visual perceptual systems operate?
- The eardrum vibrates in response to changes in air pressure.
 - The hair cells contain even smaller hairlike projections called stereocilia.
 - The basilar membrane produces a traveling wave which then stimulates the hair cells.
 - The inner and outer hair cells do not share the auditory nerve fibers equally.
30. Suppose that a researcher records electrical impulses from a fiber in the auditory nerve and plots a frequency tuning curve. This figure is likely to show
- the fiber is most sensitive to a stimulus of a specific frequency, with lower sensitivity to more remote frequencies.
 - the fiber is equally sensitive to all frequencies.
 - the fiber vibrates at the same rate as the auditory stimulus.
 - all fibers in the auditory nerve are similar to each other in their frequency tuning curves.