

ANSWER KEY	Chapter 12 Test Answer Key	BLM 12.4.1A
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Answers to **Multiple Choice** Questions

1. a
2. c
3. b
4. d
5. d
6. c
7. a
8. c
9. b
10. a
11. c
12. c
13. b
14. b
15. c
16. b
17. a
18. b
19. a
20. b

Answers to **Numerical Response** Questions

1. 6, 1, 4, 5, 2, 3
2. 4, 2, 1, 5, 3
3. 6, 7

Sample Answers to **Written Response** Questions

1. a) The sense of smell is closely linked to the sense of taste. As much as 80 to 90% of what we perceive as taste is actually due to the sense of smell (Note: Students do not need to quote actual percentages). (2 marks)
- b) The neural pathway for the sense of taste can be shown by the following flowchart:
molecules dissolve in saliva → taste buds detect molecules → taste buds transduce chemical stimulus into electrochemical impulse → impulse from taste buds travels to areas of brain stem and then thalamus → impulse travels to area of cerebral cortex responsible for perception of taste. (4 marks)

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- c) Odour molecules travel through the nose and the passages of the throat. There, they trigger the chemoreceptors, which in turn trigger the olfactory sensory neurons. When you have a cold, the excess mucous does not allow the chemical molecules in food to reach the olfactory sense organs. As a result, electrochemical impulses are not generated and the brain cannot perceive the smells. Because so much of what we perceive as taste is actually due to the sense of smell, everything tastes bland when you have a cold. (3 marks)
2. a) The hair cells are the sensory mechanoreceptors responsible for transducing pressure waves into electrochemical impulses in the inner ear. (1 mark)
- b) The mechanoreceptors for sound are hair cells on the basilar membrane in the organ of Corti, which is found within the cochlea. The hair cells rest on the basilar membrane, with the tectorial membrane above. When the stapes strikes the oval window, this vibrates the window and creates pressure waves in the fluid of the cochlea that make the basilar membrane move up and down. This, in turn, causes the stereocilia of the hair cells to bend against the tectorial membrane. The hair cells, which synapse with the nerve fibres of the auditory nerve, sense the bending of the stereocilia and relay this message to the nerves. The nerves then send an impulse to the temporal lobe of the brain. (5 marks)
- c) The amplitude of a sound wave is experienced as the intensity or volume of a sound. The louder the noise, the more the fluid within the cochlea puts pressure on the hair cells of the basilar membrane. The stereocilia of the hair cells are very delicate, and repeated or sustained exposure to loud noise can destroy the stereocilia. The result is that continued exposure to loud noises can result in noise-induced hearing loss. (3 marks)
- d) Students may have any number of answers including being around loud machinery, noise pollution, listening or playing loud music, wearing headphones, etc. (2 marks)
- e) Students should indicate that avoiding continuous exposure to loud noises or wearing protective devices will help prevent NIHL. (2 marks)
- f) NIHL is not caused by a problem with the amplification of sound waves. NIHL is caused by damage to the actual receptors (hair cells) in the cochlea. No amount of amplification will increase the person's ability to hear sound waves if the hair cells (receptors) have been damaged. (2 marks)