NAME _____ LAB TIME/DATE _____

General Sensation

Structure of General Sensory Receptors

1. Differentiate between interoceptors and exteroceptors relative to location and stimulus source:

interoceptor: _In viscera or deep in body tissues; internal stimuli_

exteroceptor: _At or close to the body surface; stimuli in external environment_

2. A number of activities and sensations are listed in the chart below. For each, check whether the receptors would be exteroceptors or interoceptors; and then name the specific receptor types. (Because visceral receptors were not described in detail in this exercise, you need only indicate that the receptor is a visceral receptor if it falls into that category.)

Activity or sensation	Exteroceptor	Interoceptor	Specific receptor type
Backing into a sun-heated iron railing	✓		_Pain receptors_
Someone steps on your foot	✓ ✓		_Pain receptors_ _Pacinian corpuscles_
Reading a book	✓		_Rods/cones of the eye (photoreceptors)_
Leaning on your elbows	✓	✓	_Pacinian corpuscles_ _Proprioceptors_
Doing sit-ups		✓	_Proprioceptors_
The "too full" sensation		✓	_Visceral receptors (stretch)_
Seasickness	✓		_Equilibrium apparatus of the inner ear_

Receptor Physiology

3. Explain how the sensory receptors act as transducers: _Convert other energy types, e.g. pressure (mechanical energy), to the electrochemical nerve impulse._

4. Define _stimulus:_ _An irritant capable of producing a response._

5. What was demonstrated by the two-point discrimination test? _The relative density of touch receptors in various body areas (lips, fingertips, etc.)_

How well did your results correspond to your predictions? _____

_____

Correlate the accuracy of the subject's tactile localization with the results of the two-point discrimination test.

Areas with the most accurate touch localization were demonstrated to have the smallest two-point thresholds.

6. Define *punctate distribution:* _Having specific localization or found at certain descrete points._

7. Several questions regarding general sensation are posed below. Answer each by placing your response in the appropriately numbered blanks to the right.

1.   Which cutaneous receptors are the most numerous?

1. _pain receptors_

2–3.   Which two body areas tested were most sensitive to touch?

2. _lips_

4–5.   Which two body areas tested were least sensitive to touch?

3. _fingertips_

6.   Which appear to be more numerous—receptors that respond to cold or to heat?

4. _back of calf_

5. _back of neck_

7–9.   Where would referred pain appear if the following organs were receiving painful stimuli—(7) gallbladder, (8) kidneys, and (9) appendix? (Use your textbook if necessary.)

6. _cold_

7. _right inferior thorax_

10.   Where was referred pain felt when the elbow was immersed in ice water during the laboratory experiment?

8. _lumbar pain_

11.   What region of the cerebrum interprets the kind and intensity of stimuli that cause cutaneous sensations?

9. _right lower quadrant of abdominal surface_

10. _medial aspect of hand_

11. _somatosensory association area_

8. Define *adaptation of sensory receptors:* _Decline in receptor sensitivity and stimulation with prolonged unchanging stimuli._

9. Why is it advantageous to have pain receptors that are sensitive to all vigorous stimuli, whether heat, cold, or pressure?

Because all of these stimuli, if excessive, cause tissue damage.

Why is the nonadaptability of pain receptors important? _Pain is a warning of actual or potential tissue damage._

10. Imagine yourself without any cutaneous sense organs. Why might this be very dangerous? _Many external stimuli (heat, cold,_

pressure) which can threaten homeostasis might go undetected, and proper protective measures might not be taken.

11. Define *referred pain:* _An experience in which pain is perceived as coming from a site other than that receiving the painful stimulus._

What is the probable explanation for referred pain? (Consult your textbook or an appropriate reference if necessary.)

Both the site of referred pain and the visceral region receiving the actual painful stimulus are innervated by the same spinal nerve(s).