## Unit 6 - Reception & Integration: The Nervous System Study Guide

#### Unit objectives:

- 1. Describe the origin of the insect nervous system.
- 2. Identify the major structures of the insect nervous system and describe their function.
- 3. Compare and contrast the physical structure and functions of compound eyes and simple eyes.
- 4. Differentiate between the two types of simple eyes.
- 5. Describe the four types of Mechanical receptors insects possess.

#### **Introduction**

Do insects have noses? Why or why not?



Briefly describe how insects smell beginning with chemical molecules binding to receptors.

## Nervous System Development

Which embryonic layer gives rise to the nervous system?

Define neuroblasts:

Define ganglion:

Which pair of ganglia fuse to form the supraesophageal ganglion?

What forms the ventral nerve cord?

If an insect is highly specialized what kind of ganglia fusion takes place?

# Nervous System Functions Label diagram 1:





Describe the functions of the following nervous system structures:

*Supraesophageal ganglion* (which three structures make up this part of the brain?):

*Protocerebrum*:

Deutocerebrum:

Tritocerebrum:

Subesophageal ganglion:

Corpora allata:

<u>Neurons</u> Fill in the following definitions.

neuron:

perikaryon (cell body):

axon:

synapse:

dendrite:

Eyes List the two simple eye types:

What is the function of the lens in all eye types?

Where are the color pigments located?

What happens when light rays hit these color pigments?

Do ocelli form clear images?

Define pigment cells:

How are stemmata different than ocelli?

Define ommatidium:

What two structures focus light onto the rhabdom in an ommatidium?

What type of image does a compound eye form?

As you increase the number of ommatidia, what happens to the resolution?

How is an ocellus different than a compound eye, or rather how is an ocellus different than one ommatidium?

#### **<u>Receptors</u>**

What is chemoreception?

What are chemoreceptors?

How do flies taste their food?

Describe a sensillum:

What is a mechanoreceptor?

What is a trichoid sensillum?

Describe how an insect detects movement.