QUIZ 09 (One Attempt)

Instructions: Download the quiz from Blackboard (in Quiz Questions Folder), print a copy and use the paper copy to work through the various questions and problems. Mark the correct answers on it. When you are ready to **submit** your answers, you will see the quiz posted under Quiz Answer Sheets.

Click the quiz name to launch the quiz. Enter your answers to each of the corresponding numbered questions onto the **blank answer sheet** (the questions will not be repeated, simply a blank page for your answers). The quiz may be saved if you do not finish entering your answers in one sitting. When you are finished with the quiz, make sure to **submit** your answers and they will be recorded.

For each question, select the one **best answer** from among those given (multiple choice). Each question is worth one (1) point.

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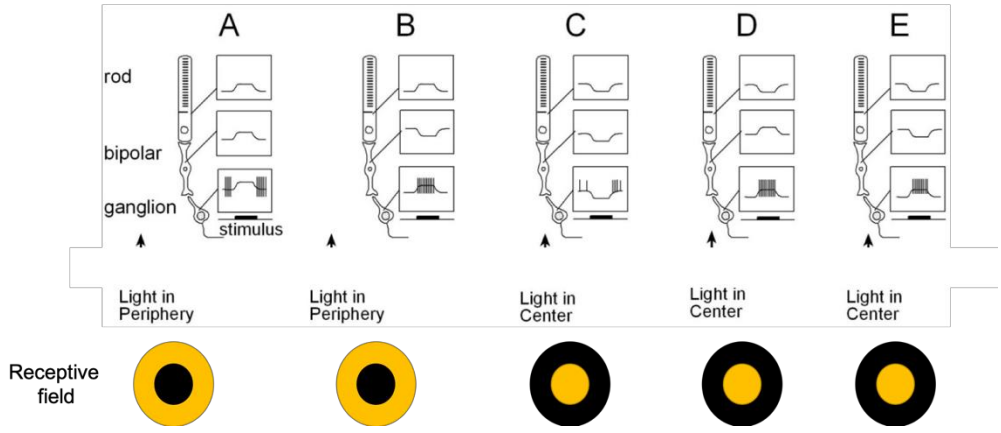
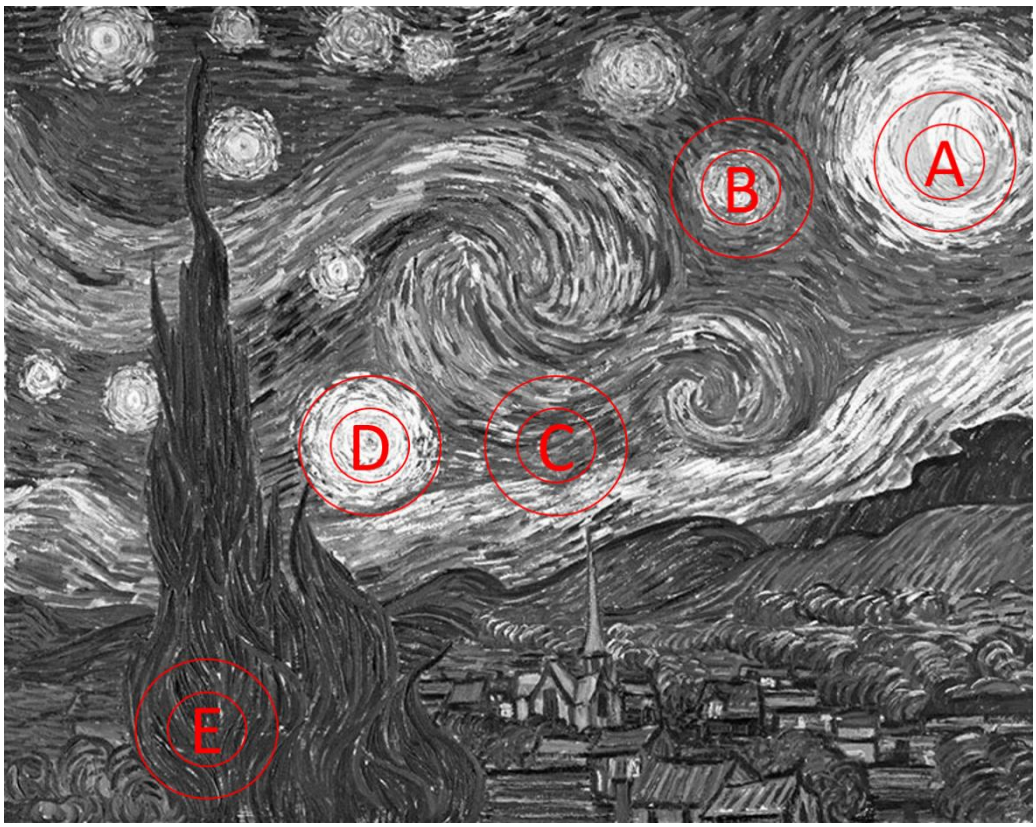
1. Which of the following diagrams correctly shows intracellular voltage recordings from a *rod*, an "**on-center, off surround**" *bipolar cell,* and an "**on-center, off surround**" *ganglion cell* stimulated with light as indicated by the arrows? (In this case, we assume each rod is innervated by only one bipolar cell and each bipolar cell is innervated by only one ganglion cell)



a) A
b) B
c) C
d) D
e) E

2. On the image below, we have depicted receptive fields for **OFF-center, ON-surround** *retinal ganglion cells*. Which of these cells is likely to **increase** its firing rate the **MOST**?

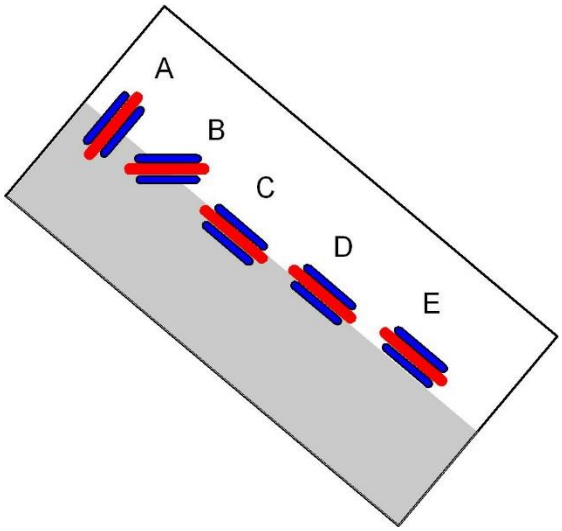


a) A
b) B
c) C
d) D
e) E

3. Using the above picture again, which of the following is likely to **decrease** its rate the **MOST?**

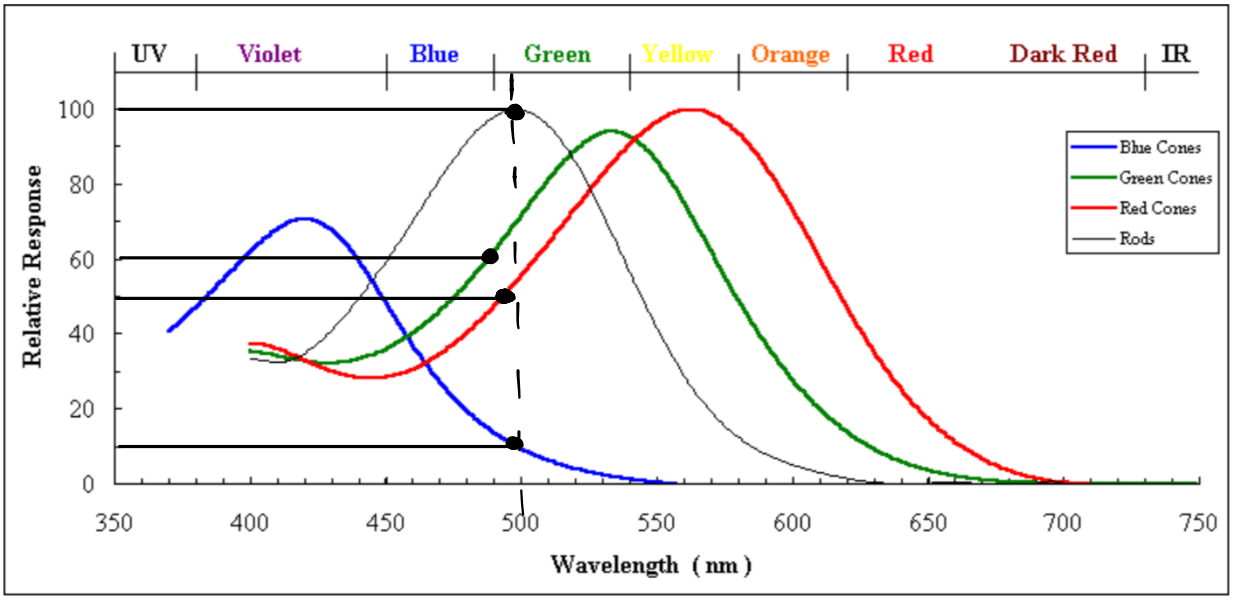
a) A
b) B
c) C
d) D
e) E

4. The figure below shows the receptive fields of 5 simple cells in the visual cortex, V1. Simple cells respond to bars of light at a particular location and orientation. The regions of receptive fields that cause excitation by light are indicated in red; the receptive fields causing inhibition by light are shown in blue. Which of these five cells will fire most strongly to the grey and white pattern projected on the screen in front of the animal?



b) B
d) D

5. According to the figure below, what wavelength of excitation light is presented to the retina when we observed these relative responses in cones and rods: Blue cones: 10, Green Cones: 60, Red cones: 50, Rods: 100

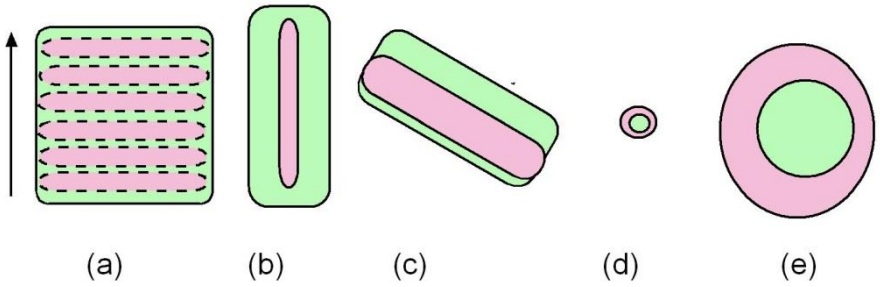


a) 420nm
b) 470nm
c) 500nm
d) 550nm
e) 580nm

Roughly 500nm

6. The figure below shows receptive fields of six different cells from various places in the visual system of a primate. Areas in pink indicate areas inhibited by light, green areas indicate areas excited by light. Areas in pink enclosed by dashed lines are alternative regions that cause responses when the stimulus is moving in the direction of the arrow. Which receptive field is from a complex cell in the area V1 of the visual cortex?

Simple V1 cells respond to a bar in a certain orientation & location

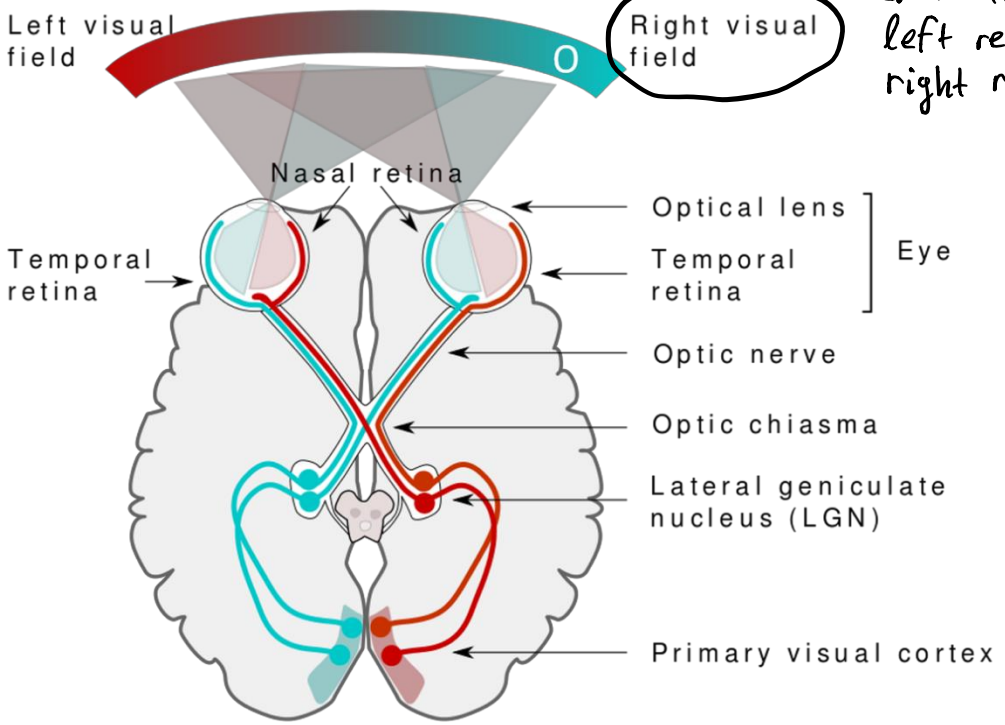


a) A
b) B
c) C
~~d) D~~
~~e) E~~

Compl V1 cells respond to bars in a range of locations.

7. An object (marked by "O") shows up at the very end of the right visual field (as shown below), describe the pathway this image will be transferred from the retina to the V1?

detected by temporal left retina and nasal right retina



a) Right nasal retina -> Left Primary visual cortex
b) Right temporal retina -> Left Primary visual cortex
~~c) Left nasal retina -> Left Primary visual cortex~~
d) Left temporal retina -> Left Primary visual cortex
~~e) Both A and C~~

Both ad work in broad sense, but for location of "O", (a) is more correct

8. Which of the following statements about nicotine receptors is INCORRECT?

   a) Nicotine is not the neurotransmitter. It is a drug that binds to this cholinergic receptor and stimulates the effect of acetylcholine.
   b) They are found in the postganglionic parasympathetic and sympathetic neurons.
   c) When stimulated, they may cause stimulation or inhibition according to the type of receptor present on the target organ.
   d) They are found in the vagus nerve.
   e) They are ligand gated cation channels.

9. Ninety percent of all the preganglionic parasympathetic fibers are found in the _____.

   a) trigeminal nerve
   b) oculomotor nerve
   c) vagus nerves
   d) facial nerve
   e) glossopharyngeal nerve

10. Which of the following does NOT secrete acetylcholine?

    a) somatic motor neurons
    b) sympathetic preganglionic neurons
    c) parasympathetic postganglionic neurons
    d) sympathetic postganglionic neurons
    e) parasympathetic preganglionic neurons

11. **Thought Question (ungraded)**: Most fishes have side-facing eyes. This means that the right eye sees only the right visual field and the left eye sees only the left visual field.

    a) Should primary visual cortex (or the equivalent in fishes) have ocular dominance columns in visual cortex?

    b) Should these animals have good stereovision?

    For part B, why or why not?

12. **Thought question (ungraded):** Many sensory systems have lateral inhibition (activation of one neuron will result in the inhibition of its adjacent neurons) at some level of

processing, either peripherally (as in vision) or more centrally. Describe a possible effect of lateral inhibition on perception for each of the following senses: vision, audition, olfaction, touch, and taste. In your answer, describe what variable you will look at (for example, for vision it could be location in space, color etc.), and how processing of that variable could change via lateral inhibition.