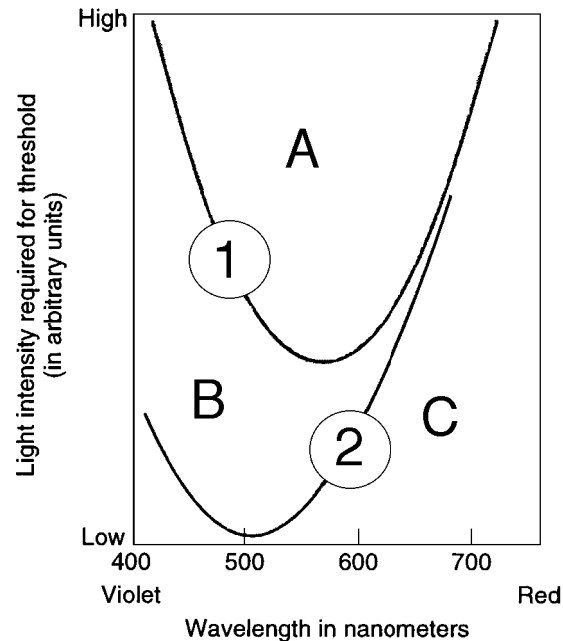


OK, read each question carefully and answer it completely. Multiple-choice questions are worth one point each. Think of a point as a minute, so expect to spend about 20 minutes writing each essay. For the essay questions, don't feel that you need to answer in prose. I'm quite happy to read sentence fragments, tables, figures, etc., as long as you're clear and complete in your answer. Keep your eyes foveated on your own exam. Good luck!!

Essay 1. We have discussed a number of different examples which indicate that perception is influenced by what we know (conceptual-driven processing). Describe at least four examples that indicate to you most clearly that perception is not simply the passive reception of visual stimuli (as a camera does), and discuss what this might mean about the relationship between memory and perception. [20 pts]

Essay 2. Distinguish between the parvo and the magno systems. Describe the processing of information that takes place in the primary and secondary visual cortex. How do the visual receptive fields differ among neurons found in the optic nerve, LGN, primary visual cortex, and secondary visual cortex? [20 pts]

1. Compared to cones,
  - a. rods provide greater acuity.
  - b. rods are significantly less abundant in the eye.
  - c. rods are more concentrated in the fovea.
  - d. None of the above.
2. Which of the following statements about dark adaptation is correct?
  - a. Only cones are involved in dark adaptation.
  - b. Both rods and cones are involved in dark adaptation.
  - c. Only rods are involved in dark adaptation.
  - d. Neither rods nor cones are involved in dark adaptation.
3. Compared to other cues to depth, accommodation is
  - a. a strong pictorial cue.
  - b. more effective in conveying relative distance.
  - c. more effective in conveying egocentric distance.
  - d. weak, at best.
4. According to the Gibsonian (direct perception) approach,
  - a. visual perception does not involve internal representations or mental processes.
  - b. traditional cues such as linear perspective and size are important for depth perception in real-world scenes.
  - c. the optic array is a poor reflection of the richness of the world.
  - d. the actions that one could do with objects are not important.
5. The hue resulting from an additive mixture of two hues
  - a. is a metamer.
  - b. represents the wavelengths of light not absorbed by the original hues.
  - c. will always be brighter than the original hues.
  - d. will always be less saturated than the original hues.
6. Achromatopsia
  - a. arises due to damage to V2.
  - b. arises due to damage to V3.
  - c. arises due to damage to V4.
  - d. arises due to damage to V5.



7. Refer to the above figure to answer the following questions: [2 pts]

Which curve is produced by rod vision?

Which curve indicates lesser sensitivity?

In which area would a stimulus not be detected by an observer?

In which area would a stimulus be detected only by rods?

8. Midget ganglion cells are

- the most common of the ganglion cells.
- predominantly connected to cones.
- relatively insensitive.
- all of the above.

9. The superior colliculus

- is a relatively sophisticated part of the midbrain.
- sends information directly to the secondary visual cortex.
- integrates information from the various senses.
- all of the above.

10. The lateral geniculate nucleus

- permits communication among the receptor cells.
- is the part of the brain that is important for locating objects.
- is the point at which the two optic nerves come together for a partial crossover.
- is a part of the thalamus where many of the ganglion cells transfer information to new neurons.

11. What do observers report when they look at an image using the stabilized retinal image technique?

- Their acuity improves.
- The contrast within the image grows stronger.
- They become light adapted.
- The image disappears.

12. Briefly describe (or illustrate) the Gilchrist study [two rooms, first dimly lit, second brightly lit], then tell me why the study is important (i.e., what important principle does it illustrate)? [5 pts]

13. Briefly describe (or illustrate) the Gelb demonstration [black circle, hidden light source], then tell me why the demonstration is important (i.e., what important principle does it illustrate)? [5 pts]

14. What does *cortical magnification* mean?
  - a. Neurons that are near each other on the retina send information to areas near each other in the visual cortex.
  - b. A weak stimulus will be intensified and magnified by the time it reaches the cortex.
  - c. Information from the fovea is over-represented with respect to the cortex.
  - d. The cortex is much larger than the retina.
  
15. Color constancy
  - a. arises when we call colors the same name, in spite of differences in the wavelengths striking our retinas.
  - b. is only roughly accurate — color perceptions are influenced by illumination differences.
  - c. was thought by Helmholtz to be due to unconscious inferences.
  - d. All of the above.
  
16. According to the ratio principle of lightness perception,
  - a. observers pay attention to the absolute intensity of the stimuli.
  - b. illumination has no effect on lightness.
  - c. we have inborn abilities to judge the albedos of various objects in a scene.
  - d. observers pay attention to the relative intensity of the stimuli rather than the absolute intensity of the scene.
  
17. The difficulties we experience in accurately perceiving stimuli in unusual orientations (such as the upside-down Mrs. Thatcher) is support for
  - a. a data-driven (bottom-up) approach to shape perception.
  - b. a conceptually driven (top-down) approach to shape perception.
  - c. the spatial-frequency approach.
  - d. the prototype-matching approach.
  
18. Briefly define/describe simultaneous color contrast, then tell me why this effect is important. What does this effect tell you about color constancy? [5 pts]

19. People who favor the Gestalt approach to shape perception argue that
  - a. all experiences can be analyzed into their most basic sensations.
  - b. shape perception can largely be explained at the physiological level.
  - c. all species tend to organize shapes in the same fashion.
  - d. we perceive objects as well-organized wholes.
  
20. One explanation for the moon illusion, favored by Rock and Kaufman, is that
  - a. the moon appears to be farther away when it is up above.
  - b. the moon appears to be closer when it is on the horizon.
  - c. the moon appears to be farther away when it is on the horizon.
  - d. the sky appears to be flattened.
  
21. The difficulty of linking the input from the two retinas is referred to as
  - a. the correspondence problem.
  - b. the constructivist problem.
  - c. the complementary problem.
  - d. binocular disparity.
  
22. Briefly explain the concept of visual angle, then tell me how this concept lies at the heart of Emmert's Law. [5 pts]