

Study Guide for the mid-term examination (Tuesday, 13 November 2001). Be able to answer the following questions and be familiar with the concepts involved in the answers.

1. What is the contrast sensitivity function (CSF) and how is it measured? What is the relationship between the CSF and visual acuity?
2. How does an infant's contrast sensitivity function compare with that of an adult? Draw them on the same graph, and discuss the meaning of the graph.
3. Draw a diagram of the major visual pathways from the eye to the thalamus, the cortex, and the midbrain. Include the optic nerve, optic chiasm, lateral geniculate nucleus, superior colliculus and the visual cortex.
4. Compare and contrast two models of object perception/recognition.
5. Discuss the evidence that our color vision is based on three different types of cone receptors. What is the evidence supporting the existence of opponent process color mechanisms.
6. What are the major types of color defective vision and what are their causes? What kind of color experiences might a deuteranope have?
7. Consider two colors, C_1 and C_2 , described by color equations $C_1 \equiv 10X + 5Y + 7Z$ and $C_2 \equiv 20X + 10Y + 14Z$. Would they be metameric matches? Would they have the same C.I.E. chromaticity?
8. Assume that the following equations describe the reaction of the red-green and of the yellow-blue chromatic opponent processes. What would the color be of an object that caused the three cone types to absorb the following amount of light: $L=5$, $M=20$, $S=5$?

$$(\text{red} - \text{green}) = 1.89 \cdot L - 2.79 \cdot M + 0.45 \cdot S$$

$$(\text{yellow} - \text{blue}) = 0.85 \cdot L + 0.22 \cdot M - 1.72 \cdot S$$

9. When a person loses one eye, why is depth perception not lost?
10. Describe the "size/distance" (size constancy) hypothesis of certain visual illusions. Pick two such illusions and explain them in terms of this hypothesis.
11. In stereoscopic vision, where must an object be located in relation to the Vieth-Müller circle to have zero retinal disparity?
12. Why does the world remains stable when we move our eyes and head? Why is it more difficult to tickle ourselves than to tickle someone else? What happens if we paralyze the eyes and attempt to move the eyes to the **right**? Why?
13. What do the McCollough effect and the spiral aftereffect have in common? What implications does the later have for models of motion perception?