

Study Guide for the mid-term examination (Friday, 22 February 2002). Be able to answer the following questions and be familiar with the concepts involved in the answers.

1. Draw a “typical” **psychometric** function relating percent correct to stimulus intensity. Be sure to label the axes. Indicate on the graph how the stimulus “threshold” is defined. What is the relationship between the “threshold” as a point on a psychometric function and threshold as a theoretical concept?
2. What are the three classical methods that G. T. Fechner developed to measure internal sensory thresholds?
3. What is a Receiver Operating Characteristic (ROC)? Describe the ROC predicted by the High Threshold Model and by Signal Detection Theory of detection. How do you compute sensitivity (d') and decision criterion (X_c) from the hit rate and the false alarm rate for the equal-variance dual-Gaussian signal detection model?
4. Draw a diagram of the eye including the following structures: cornea, lens, pupil, iris, sclera, aqueous humor, vitreous humor, retina, optic disk and optic nerve.
5. What are the optical properties of the eye? Be able to define the following terms: dioptres, optical power, relative optical power, accommodation, near point, far point, range of accommodation, emmetropia, myopia, and hyperopia.
6. Draw a diagram of the retina including the following parts: rods, cones, horizontal cells, bipolar cells, amacrine cells, ganglion cells and the optic nerve.
7. Define the term “receptive field.” Describe the receptive fields of retinal ganglion cells. How do they differ from the receptive fields of cells in the primary visual cortex?
8. Why do dark-adaptation curves and the Purkinje shift indicate that there are two receptor systems in our retina?
9. Four important stimulus variables that affect the visibility of a target are contrast, size, exposure duration, and average level of illumination. What is Weber’s Law?
10. If a person is injured in the upper left region of the primary visual cortex, what change in vision, if any, do you expect?
11. 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.
12. What is the contrast sensitivity function (CSF) and how is it measured? What is the relationship between the CSF and visual acuity?
13. 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.