Practice exam Cognitive Psychology and its Applications

1) What is the inverse projection problem?

A: The fact that visual input projects onto the contralateral hemisphere.
B: The fact that from a retinal image alone there is no certainty about the visual environment.
C: The fact that bottom-up visual processing is biased by top-down expectations.
D: The fact that the visual cortex has to support both visual perception and memory recall.

2) Rank the fovea, parafovea and perifovea from best to worst, on:

a) Color vision:
b) Acuity:
c) Light sensitivity:

3) Imagine in an experiment you're comparing conditions A and B, and you hypothesize better performance in A than B. You find faster responses in A, and also a higher number of errors in A. Both effects are significant. Would you consider this study evidence for your hypothesis? Explain.

4) Why is a within-subjects design typically preferred over a between-subjects design?

5) Give an example of a situation where a between-subjects design is unavoidable.

6) Rank sensory memory, short-term memory and long-term memory, from best to worst, on:

a) Capacity:
b) Longevity:

7) Which of the following is *not* a Gestalt principle?

A: symmetry
B: closure
C: proximity
D: common ground

8) Imagine a participant has an average response time (RT) of 2000 ms and an accuracy of 80%. What is the inverse efficiency score (IES)? Provide a calculation.

9) What is a potential benefit of inspecting RT density plots rather than just comparing means?

10) The army has an entry exam where candidates have to distinguish target enemies from innocent civilians. Candidates get 200 trials, 100 of which are target enemies (the candidate would have to shoot) whereas the other 100 are innocent civilians (the candidate has to refrain from shooting).

Candidate A classified 80 out of 100 enemies as such, while classifying 20 out of 100 civilians as enemies.

Candidate B classified 100 out of 100 enemies as such, while classifying 50 out of 100 civilians as enemies.

Using signal detection theory, how would you calculate sensitivity (d') for both candidates? Provide all values that are needed in the calculation.

11) In a staircase procedure, the task difficulty is adjusted less and less after each oscillation. Explain why this is important.

12) Provide two arguments against Expected Utility Theory

13) In a linear mixed-effects model, you can have random intercepts and random slopes for participants. Explain what these two things mean.

14) What are two key defining properties of language (i.e., what sets 'language' apart from 'communication')?

15) Many interfaces make use of predictions. For example, in Google Chrome, when typing the first letter of your name in a field, Chrome might automatically fill in your entire name, address, phone number, et cetera. Using at least two interface design principles, explain why this could be both good and bad.

16) In most swimming locations (e.g., beaches, lakes), colored flags communicate whether or not it is safe to swim, whether certain things need to be taken into account (e.g., presence of jellyfish, bacteria), et cetera.

Jasmine theorizes that adding icons to the flags (e.g., an icon of a jellyfish on the 'jellyfish' flag) will improve comprehension, but only if viewers are within a 50m radius of the flag.

Using three criteria for theoretical quality, explain how well this theory scores in your opinion.

17) Robbie hypothesizes that when there are stripes on clothing, thicker stripes lead to higher aesthetic appraisal (i.e., how pretty people find the clothing). In his study Robbie measures this through pupil size, as prior studies have suggested that higher aesthetic appraisal leads to larger pupils. Robbie tests white dresses with black stripes.

Can you come up with a reason why pupillometry may be problematic in this setup?