Human Information Processing 28-may-2003

Name _____

Student number ----------

PART I: Short Answers. Read the whole question, and answer each part of the question!

1. When we study human cognition we focus in two aspects: Individual cognition and distributed cognition. What is the main difference between them?

2. Explain the main assumptions of the Human Information Processing approach.

3. In the course we explained **goals for HCI** (Human Computer Interaction) of studying Human Information Processing in systems design. Explain them.

4. The first step in scientific research is to develop a **theory**. Explain briefly the three types of theories used in scientific research?

5. Explain two advantages and two disadvantages of doing field studies (observations)

6. If the aim of my research is to determine the **causal relationships** between the characteristics of a system's interface and the user's performance, what research method should I use?

7. Describe the steps in the Scientific method

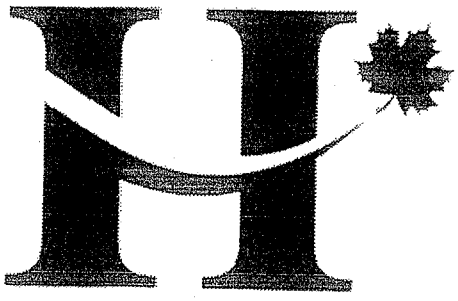
8. Define Perception

9. Define absolute threshold

10. Define Vision and light

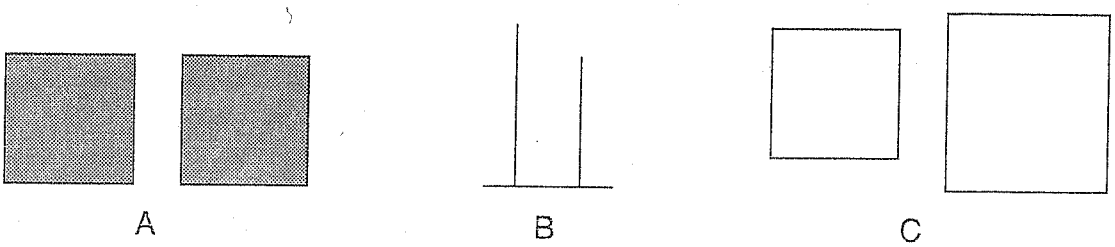
11. Explain the Gestalt's law of similarity and draw an example.

12. In the following image, which gestalt principle(s) is/are being used? How can you tell?



13. Explain at least two pictorial cues that you use while perceiving depth in the following picture.

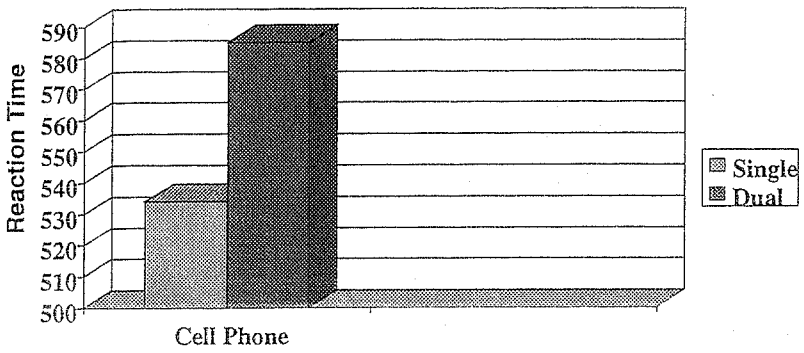
14. Order from most effective to least effective the following three graphical methods for presenting quantities to be compared.



15. Strayer et al (2003) performed an experiment with cell phones while driving. Two groups of people participated in the experiment:

- Group "single-task": subjects had to drive (in a simulator)
- Group "dual task": subjects had to drive (in a simulator) while having a cell phone conversation

Subjects had to react to red and green traffic signals. The following graph shows the results they obtained. From these results, what can you conclude about driving while having a phone conversation? Why?



16. Explain the three memory systems describing the duration and capability of each of them.

17. How can you improve the capacity of Working memory?

18. What are the contents of semantic and episodic memory?

a. Your knowledge about the concept of "house" is in semantic or episodic memory?

b. Your knowledge about the things you did yesterday is in semantic or episodic memory?

19. Define structural and functional mental models.

20. What is the main assumption of Distributed Cognition?

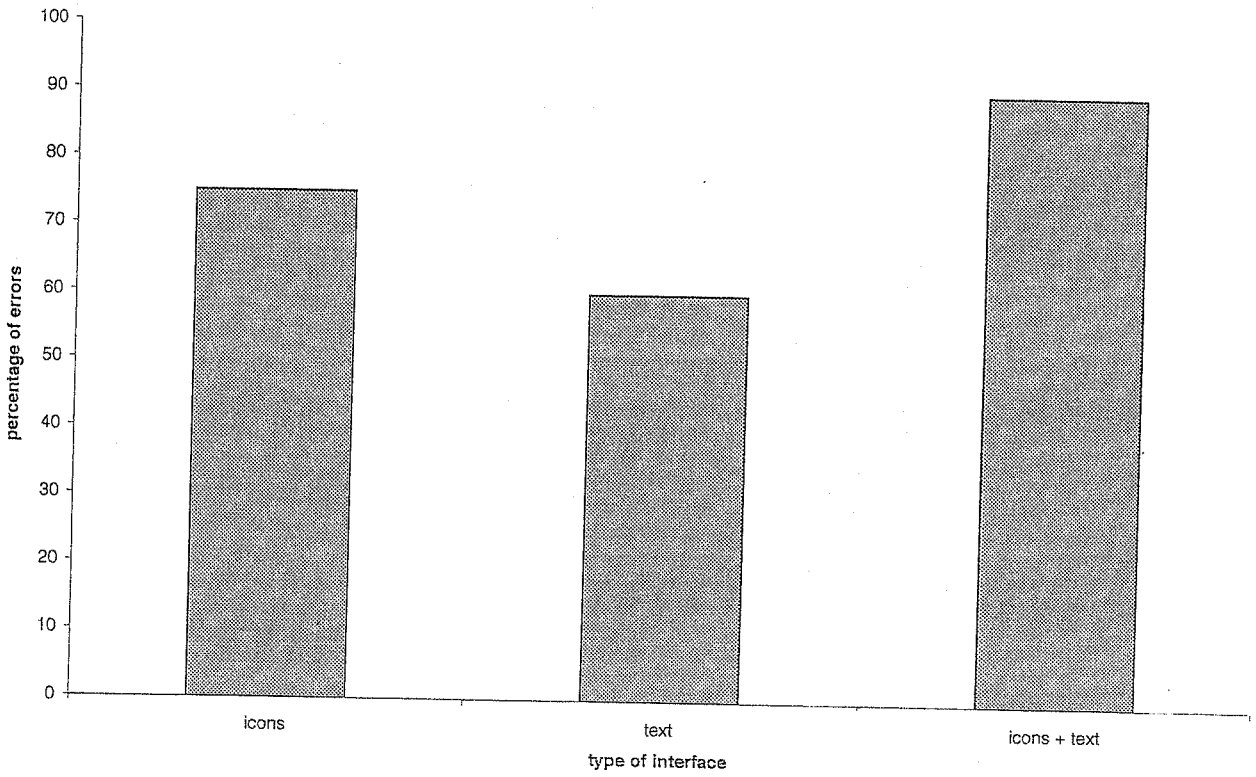
PART II. Exercise

Answer the different questions in the exercise.

1. A group of researchers wanted to know if the use of icons in a user interface was better than text. To answer this question they performed an experiment with three different versions of an interface:

- Interface with icons only
- Interface with icons and text
- Interface with text only

A total of 18 subjects participated in the experiment. Their task was to work with the interface to solve a "simple task". The following graph shows the results they obtained.



Answer the following questions:

a. What is the independent variable and what are the levels (or conditions manipulated) of the independent variable?

b. What is the dependent variable?

c. What was the null hypothesis (H_0)?

d. According to the graph, what may be the conclusions (if the effect represented in the graph is statistically significant)?