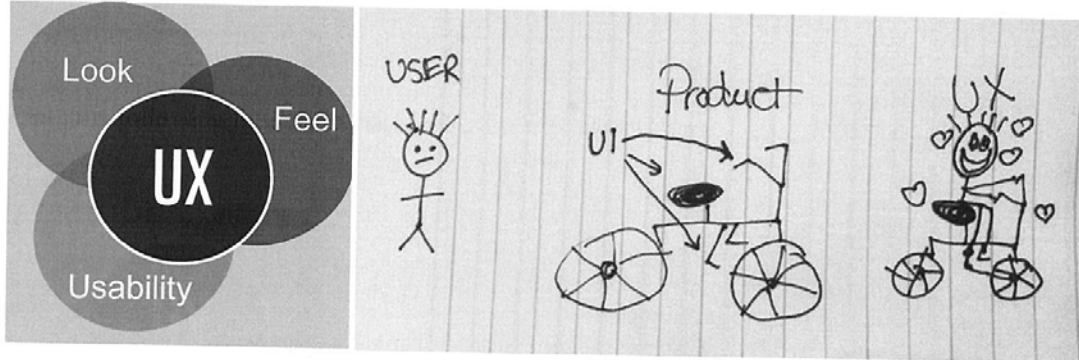


1062 機械系博士班資格考試題目

考試科目	方式	
Design and Manufacturing	Closed Book, Calculator is prohibited.	Part I

1. From the following figures, explain what is UX design? (10%)

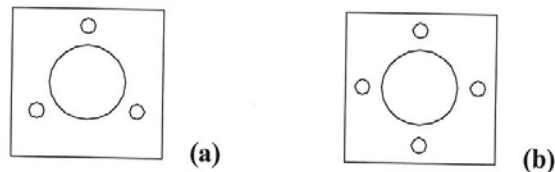


2. What is a “modular design architecture”? (3%) Give 2 examples and explain why. (4%) The chair in the figure is in an “integral design structure”, explain why. (3%)

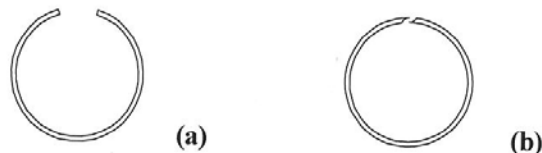


3. Consider design for assembly (DFA), which design in the following pairs is better? Why?

(1) 5%

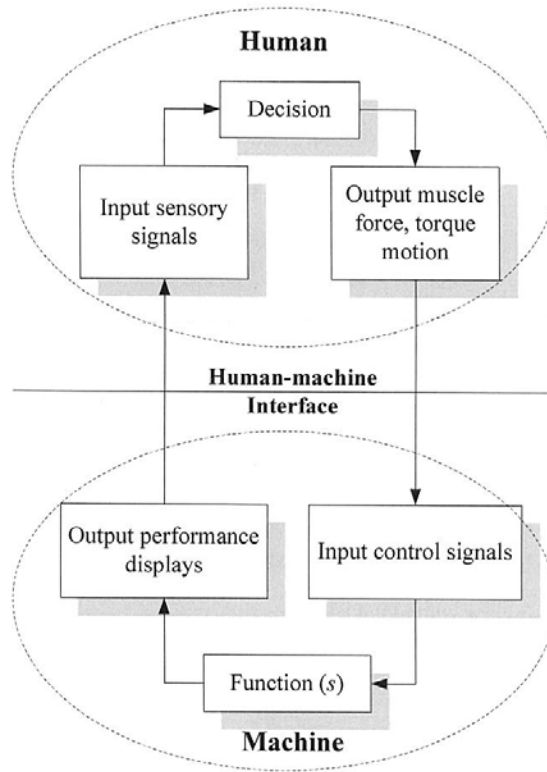


(2) 5%



4. “Internet of Things” (IoT) has been a popular issue in product design. Describe the signal / command flow in the following IoT scenario: A person wakes up in the morning and left bed, the light in the bathroom is automatically turned on, and the coffee machine in the kitchen starts to make coffee. (10%)

5. Using the elevator in Building 3 as an example, describe the following figure of a human-machine system (10%).



1062 機械系博士班資格考試題目

考試科目	方式	
Design and Manufacturing	Closed Book, Calculator is prohibited.	Part II

1. During forming process, the mechanical properties of material will increase due to work hardening effect, Please explain:
 - i. What happened to the metallurgical structure? (5%)
 - ii. However, the work hardening effect does not take place under hot working, why? (5%)
2. Please explain the Carburizing process and the mechanism of increase in hardness. (10%)
3. Please explain how the cooling rate in casting process affects the metallurgical structure, material characteristics and workpiece quality. (10%)
4. Please explain how the plastic bottle were made. (10%)
5. Please explain how a self-lubrication bearing were made. (10%)