

系所組別：工業設計學系甲乙丙丁組

考試科目：工業設計

考試日期：0226，節次：1-4

Notice

- Please read the entire description before answer. You can answer in Chinese.
- **Tabulate** and **visualize** your answer as much as you can.
- You do not need to give any detailed colorful rendering. Instead, **rough sketch** (using pencil, ball pen, roller pen, or marker) is completely acceptable and probably much better than rendering.
- Any answer not related to the question certainly results in **score subtraction** or even your **disqualification**.

Description

The question sheets include four pages. This page you are reading now is page 1. A design approach with a product case is introduced from page 3 to 5, including 18 sketches in page 4 and 5. Please answer all questions exactly based on the design approach.

Questions

[Choose one best answer]

1. The design approach involving 16 sketches can be simplified as: (5%)
 - (A) To understand users, establish requirements, and design its appearance.
 - (B) To sketch ideas, make mock-ups, and design appearance.
 - (C) To acquire basic data, establish requirements, and design a product.
 - (D) To analyze, synthesize, and design.

2. Which sketches are resulted from sketch 3? (5%)
(A) 4, 5, and 6. (B) 13, 14, 15, and 16. (C) 9, 10, and 11. (D) 5, 6, and 7.

(背面仍有題目,請繼續作答)

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3. Which requirement is less valuable in this case? (5%)
(A) About vision. (B) About handle. (C) About wind pressure.
(D) About collapsibility.
4. Which task is not mentioned in this design approach? (5%)
(A) Analysis. (B) Framing problems. (C) Engineering. (D) Styling.

[Design practice]

5. Apply this design approach to develop one or more ideas of water-reusing products. (40%)
Notice:
(1) About format, you must show 16 sketches in a well-organized table on your answer sheets, including 4 sketches for illustrating general information, 8 sketches for requirements, and 4 sketches for realization. Each sketch may include drawing and/or text description if necessary.
(2) Reusing water is different from saving water. It means a certain amount of water is used for at least two times. Your task is to design a product idea for doing so.
6. Apply this design approach to develop one or more product ideas according to your target research group (甲、乙、丙或丁組) at the graduate school of Industrial Design, NCKU. (40%)
Notice:
(1) You must clearly mention the group (甲、乙、丙或丁組) that you apply for in your answer sheets.
(2) About the design project and format, you must follow the description mentioned in 5. (1).
(3) You can choose any product type by yourself. However, its type and function must relate to your study track and therefore your knowledge background and capability in design research can be objectively reviewed.

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Independent analysis is a difficult technique to communicate intelligibly to another person. Every problem is different, and the extent to which the analyst—who need not necessarily be the designer himself—goes into detail, and the particular manner in which the study is conducted, will vary widely from product to product and problem to problem. Without multiplying examples ad infinitum, it may help to give another example, reduced to simplest terms.

Let us suppose your client is a manufacturer of umbrellas. He wants something new and startling—the umbrella of today is very little different from the same product of a hundred years ago. You can buy them jointed so that they fold up into very small space, but in use they are still the same old spring-rib and stretched-fabric article.

The next two pages disclose a set of rough sketches. We begin with basic data on the weather and on human dimensions which, combined, describe a “zone of protection” which the umbrella of the future should be designed to provide. In sketch 5 we enter the field of use requirements, and find that in most cases only about half of the total zone of protection is necessary to make the umbrella a practical device. Sketches 6 and 7 further define the areas of protection, and 8, 9, 10, and 11 emphasize the importance of vision, support, and collapsibility.

In the course of the study so far, we have come to the conclusion that (1) forward visibility in a driving rain, (2) avoidance of wind pressure, and (3) collapsibility would be valuable adjuncts to the product. Collapsibility is not new. In the modified design, after discarding the louver at the top as impractical, we retain the new feature of improved vision, and when we begin to develop the modified design technically, we conceive the idea of inflatable ribs, thus producing a new kind of collapsibility! In sketch 16 we further develop the design appearance-wise and find that by “streamlining” it we have gained some easing of the wind-pressure problem.

This is not an actual study. It was done, as the illustrations indicate, from a semihumorous point of view to illustrate an article for a business magazine.² Nevertheless, it serves excellently as a demonstration of the principles of research and analysis. The method can be applied to an infinite variety of problems of a serious and much more intricate kind.

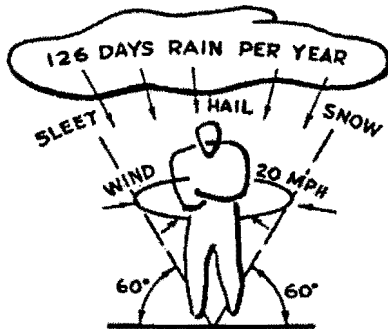
(背面仍有題目,請繼續作答)

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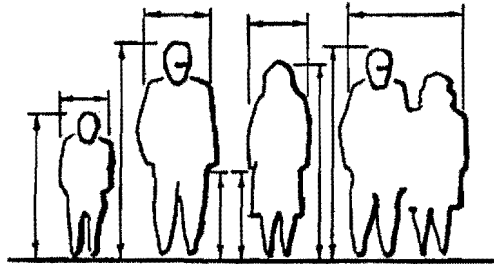
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1. Basic data - weather



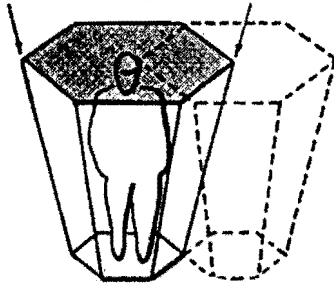
Weather conditions establish character of need

2. Basic data - human dimensions



Human dimensions control size and proportion

3. Basic data - protected zone



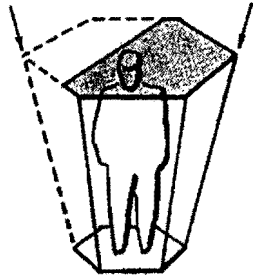
Weather conditions and human dimensions establish zone to be protected

4. Basic data - additional

For this problem factors of walking speed, body positions, groupings of several individuals, and others supply additional basic data.

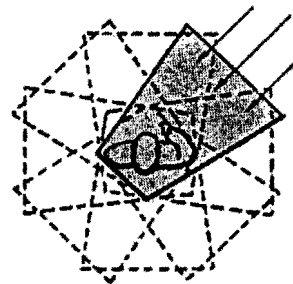
In all problem, similar basic data dictate fundamental conditions to be met by the product.

5. Requirements - protective area



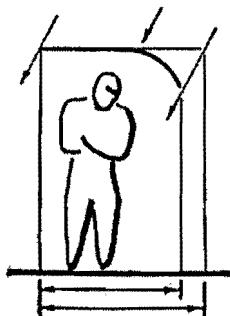
Area adequate for protection against one direction of rain is first requirement of the umbrella

6. Requirements - extended protection



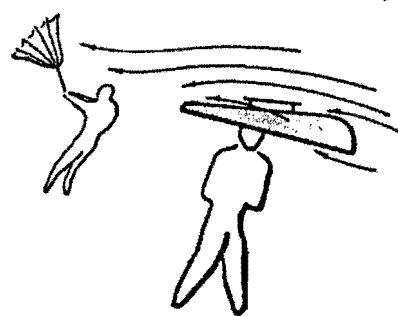
Basic protective area must provide protection regardless of rain direction

7. Requirements - minimum interference



To reduce interference with others the size should be minimum without losing protective quality

8. Requirements - indestructibility



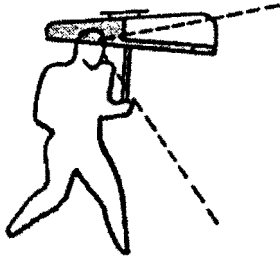
Umbrellas must withstand high winds without damage-note louver that eases wind pressure

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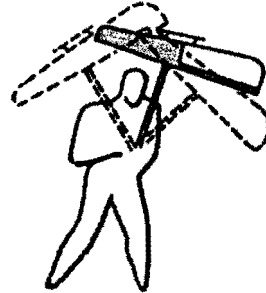
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9. Requirements - vision



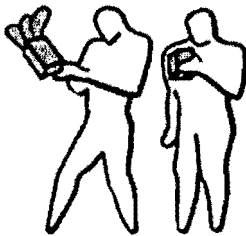
User must have adequate forward vision-note that clear plastic could provide protection and vision

10. Requirements - support



Handle must provide convenience, rigidity, and adjustability

11. Requirements - collapsibility



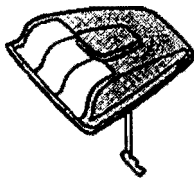
When closed, umbrella should be compact and easy to carry

12. Requirements - others

Other requirements, such as protection against drip, imperviousness to moisture, and ease of drying, dictate other factors for the design.

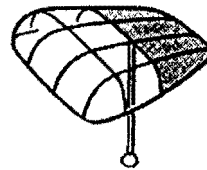
In any product the character of its requirements combined with the basic data establishes the specifications for the ultimate design.

13. Design -ultimate



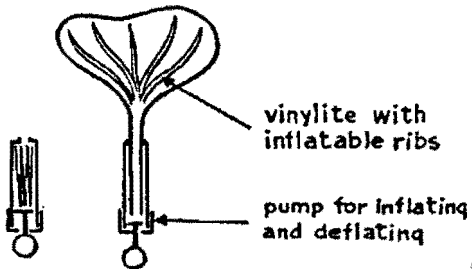
The ultimate design incorporates all established requirements-note handle for gripping comfort

14. Design -modified



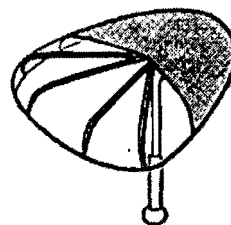
Ultimate design modified to comply with factors of practicability and consumer acceptance

15. Design - technical



Here, design is engineered to take into account production and cost factors

16. Design -appearance



Here, design is styled to meet consumer standards