Part 1: Short Questions (16 pts)
In your exam notebook write TRUE or FALSE:

(2 pts) 1. Direct manipulation is an interaction technique in which users perform actions by manipulating a tangible physical object.  
   (TRUE / FALSE)

(2 pts) 2. The benefit of using icons such as a trashcan or a folder, over using English text, is that they are universally understandable and thus promote internationalization.  
   (TRUE / FALSE)

(2 pts) 3. Adaptive menus violate the positional consistency principle.  
   (TRUE / FALSE)

(2 pts) 4. The menu design of Microsoft Paint (or a similar drawing application), while it would not scale down well to very small displays, it should scale up to wall displays.  
   (TRUE / FALSE)

(2 pts) 5. Features such as context-aware auto-completion, auto-correction, error highlighting by squiggly lines, tooltips, fillin statement templates, etc., currently popular in IDEs such as Microsoft Visual Studio and Eclipse, can significantly reduce some of the problems of command languages.  
   (TRUE / FALSE)

(2 pts) 6. “Interior/Exterior” is a congruent pair of adjectives.  
   (TRUE / FALSE)

(2 pts) 7. The touchpad is a direct-control pointing device.  
   (TRUE / FALSE)

(2 pts) 8. Eye-tracking controllers have an advantage of being inherently free from the “Midas Touch” problem.  
   (TRUE / FALSE)

Part 2: Fitts’s Law (24 pts)
Recall Fitts’s Law for predicting movement time as a function of distance and width.

\[ MT = a + b \cdot \log_2 \left( \frac{D}{W} + 1 \right) \]

(6 pts) 1. Explain what \( MT, D, \) and \( W \) the formula refers to. You may use a drawing to illustrate your answer.

(8 pts) 2. a. To which user age group(s) (children, adults, and elderly) does Fitts’s Law apply to?
   b. Thinking about the trajectory of mouse cursor movements in a repeated target-selection task, which user age group may be particularly disadvantaged by cascading pull-down menus? Explain why?
   (cascading menus are multiple-level menus in which mouse hovering above some menu options, causes a sub-menu to appear to their right)
3. Consider the task illustrated in Figure 1. A 600-by-400 pixels screen is divided at its center by a horizontal line that is 5 pixels thick. The mouse cursor is initially positioned at the top-center of the screen and the user is instructed to click anywhere on the line as quickly as possible. Ignoring any potential stress effects, show a derivation of just the $D/W$ term in this case.

![Figure 1 Line click task.](image)

4. In Microsoft Internet Explorer 7, even when it is maximized, the right scroll bar is separated from the screen edge by a few pixels. Considering that the mouse cursor always stops at the edges of the screen, explain what is the implication of Microsoft’s design choice for users without a scroll wheel?

Part 3: Design Critique (30 pts)

1. In Microsoft Office 2007 the Ribbon interface (Figure 2) replaced the menu + toolbars design of earlier versions. Name two advantages and two disadvantages of this new design.

![Figure 2 Microsoft Office 2007 Ribbon (broken into two lines).](image)

2. Microsoft Office allows users to customize the interface. Argue for and against this feature.
Part 4: Design (30 pts)

1. United (Figure 3) and Kayak (Figure 4) are two websites that allow users to search and book flights. Give two advantages/disadvantages for the United site and another two for the Kayak site. (NOTE: Your four points must refer to different aspects of these sites, do not repeat the advantages of one as disadvantages of the other)
You have been hired by FlyHigh Airlines to design their support website used by travel agents. The website has a menu allowing agents to manage their customer’s flights and perform the operations enumerated in Figure 5. Assume that agents manage hundreds of flights.

**Design** the menu, **draw** it, and **explain** why you have chosen your particular organization.

<table>
<thead>
<tr>
<th>Check arrivals / departures</th>
<th>Print e-ticket</th>
<th>Choose seating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Update address</td>
<td>Change flight</td>
<td>List recent flights</td>
</tr>
<tr>
<td>Cancel flight booking</td>
<td>Book flights</td>
<td>Update telephone</td>
</tr>
</tbody>
</table>

**Figure 5** Travel agents operations

*Good luck! ☺☺ ☺☺*