

IS4300 - Sample Exam Questions

Name _____

Table 1. Classes of usability problems

- A. visibility problem
- B. feedback problem
- C. conceptual model problem
- D. affordance problem
- E. internal consistency problem
- F. external consistency problem
- G. simplicity problem
- H. problem preventing errors / not allowing error recovery
- I. problem not speaking the user's language

Table 2. Usability metrics

- M. learnability
- N. efficiency
- O. memorability
- P. error rate
- Q. satisfaction

Table 3. Measure Types

- R. ordinal
- S. nominal
- T. ratio
- U. interval

I. Concepts & Definitions (20%)

1. What is usability?

2. Why is the classic waterfall development methodology inappropriate for HCI?

3. What is one UI design technique that minimizes user memory load? How does it do this?

I. Concepts & Definitions, continued

4. Usability problems. For each of the following write which usability problem from Table 1 best describes the problem.

4a. ___ A user just selected "File.../Save" from their application's menu, but has no idea whether anything was actually saved or not.

4b. ___ A user is trying to open a file in an interface, but has no idea what to click on.

4c. ___ A user clicks the little 'x' on the upper right corner of their new Windows-based joke-of-the-day application but, instead of closing the application (as the user expects), it displays another joke.

4d. ___ A user clicks on one of the arrows in the UI panel shown but nothing happens (the user is supposed to drag the arrow in the indicated direction to scroll the display).



I. Concepts & Definitions, continued

5a. Indicate which of the following orderings is correct for the 7 steps of Norman's interaction model (O1-O6): _____

	<u>Orderings (pick one):</u>
1. formulate intention	O1. 1 2 3 4 5 6 7
2. interpret system state	O2. 6 1 4 7 3 5 2
3. evaluate system state with respect to goal	O3. 4 7 5 2 3 6 1
4. specify actions at interface	O4. 6 1 4 7 5 2 3
5. perceive system state	O5. 1 6 5 4 7 2 3
6. establish the goal	O6. 7 3 2 1 6 4 5
7. execute action	

5b. ____ Which step above concerns the "gulf of execution"?

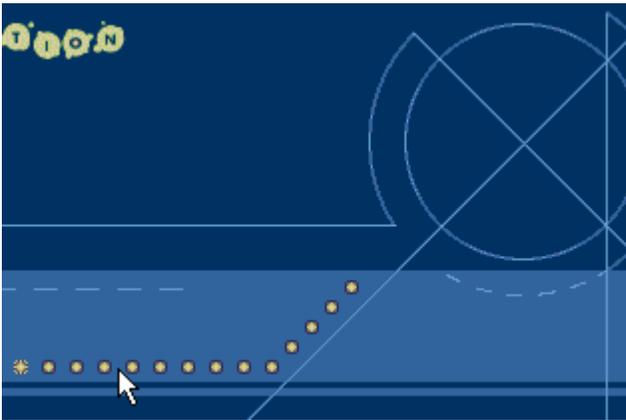
5c. ____ What kind of usability problem (Table 1) does the "gulf of execution" impact?

5d. ____ Which step above concerns the "gulf of evaluation"?

5e. ____ What kind of usability problem (Table 1) does the "gulf of evaluation" impact?

II. UI Critique (15%)

6. Below is an attempt at a novel mechanism for website navigation. On the homepage is a series of dots (7 pixels in diameter). As you hover the mouse over each dot, a description of the hyperlinked page appears in the circle to right. You click on the dot to navigate. Critique the UI using categories from Table 1.



II. UI Critique, continued

7. Below is an interface to let users create SQL (database query) commands using a GUI. When you click on one of the check boxes at the top it inserts the appropriate command phrase into the SQL command string at the bottom, then immediately unchecks the checkbox. Critique the UI using categories from Table 1.

Define Query - act_nova

Status: registered assigned completed deferred

Subsystem: Any Priority: Any

Platform: Any Release: Any

Task Events

That were completed by user bubba

on date

Query String:

Clear [copy icon] () or and ()

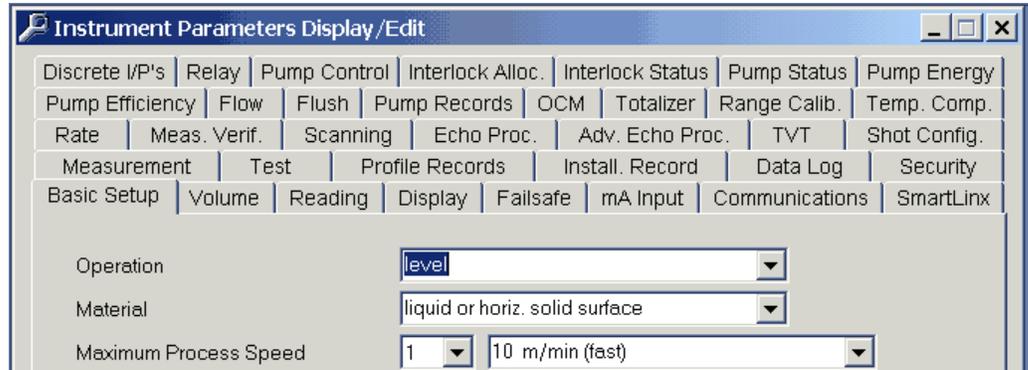
(resolver='bubba') and (status='completed')

OK Reset Close

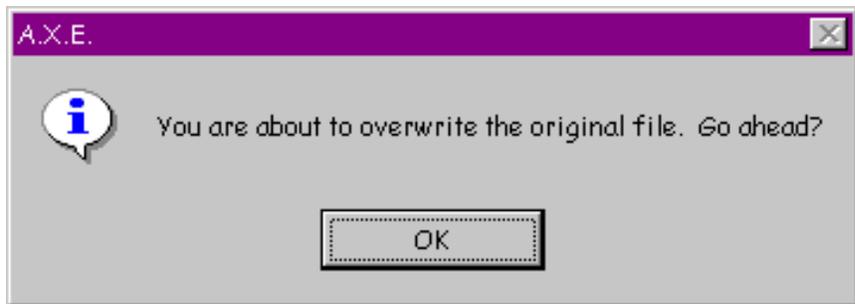
II. UI Critique, continued

8. For each of the following, list the single most significant usability problem in Table 1 that applies:

8a. _____



8b. _____



8c. _____



III. User & Task Analysis (5%)

9. You are to design a new interactive grocery store kiosk to dispense gumballs, to replace the racks of mechanical gumball machines found at the front of most stores.

9a. Who are the primary stakeholders?

9b. Who are the secondary stakeholders?

9.c Who are the tertiary stakeholders?

9d. Who are the facilitating stakeholders?

IV. Ethics of Human Subjects Research (5%)

10. You want to evaluate a new brain implant to connect users to their smart phones.

10a. You select a study population of prisoners in Oklahoma to do your testing. Which ethical principle does this violate?

Autonomy

Beneficence

Justice

10b. Study subjects are identified by the warden, who tells them they have to participate or lose their leisure privileges. Which ethical principle does this violate?

Autonomy

Beneficence

Justice

10c. Study subjects are told they will be the envy of their cellmates with their new iPhones, but are not told of any risks associated with the procedure. Which ethical principle does this violate?

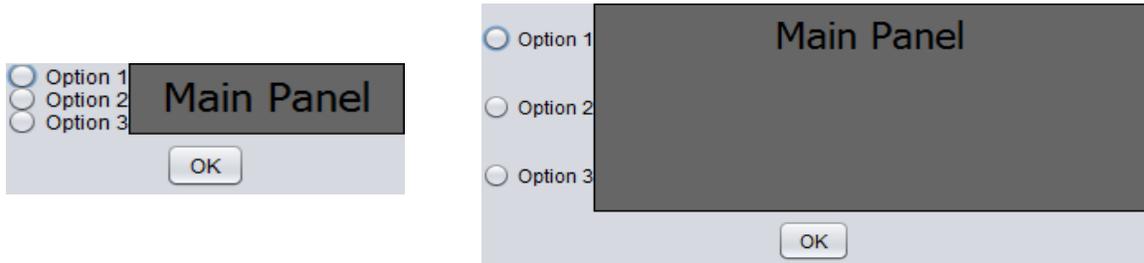
Autonomy

Beneficence

Justice

V. Java Swing (5%)

11. Show a panel hierarchy, and associated layout managers, required to produce the layout shown below (same window at two different sizes).



Example hierarchy:

- Outer Frame (Flow layout)
 - Main Panel (Flow layout)
 - Option Panel (Border layout)
 - Option 1 Radio Button (North)
 - Option 2 Radio Button (Center)
 - Option 3 Radio Button (South)
 - Button Panel (Grid layout, 1 row, 1 column)
 - OK Button

Your answer:

VI. Data Analysis (10%).

12. What are the types of the following measures (Table 3)?

12a. ___ Latte size (small/medium/large)

12b. ___ Servings of fruit per day someone eats

12c. ___ Score on a 5 item, 7-point Likert scale

12d. ___ Whether someone smokes or not (yes/no)

12e. ___ Time to complete a standardized task

13. Below is an excerpt from a study questionnaire. For each numbered question, indicate (via checks on the following page) the descriptive statistics you would use. Assume interval and ratio measures are approximately normal unless noted

Sample Questionnaire

Please take a moment and answer a few questions about yourself:

Q1. Age: _____ Q2. Sex: M , F, Other _____ Q3. Weight: _____

Q4. Ethnic Background (check one):

- American Indian or Alaskan Native _____
- Asian or Pacific Islander _____
- Black, Not of Hispanic Origin _____
- White, Not of Hispanic Origin _____
- Hispanic _____

Q5. How satisfied are you with the new Monkey Torture game?

not at all • • • • • • very satisfied

Q6. How long did you play the game for (in minutes) _____

VI. Data Analysis, continued

13. continued

	Mean	Median	Mode	StdDev	Inter-quartile range
Q1.					
Q2.					
Q3. With outliers that can't be dropped.					
Q4.					
Q5.					
Q6.					

VII. Usability Testing (40%)

Short answers (10%).

14. How do you determine how many test users you need for a comparison evaluation study in which you will be proving which of two interfaces is better, based on quantitative usability metrics?

15. How do you determine how many test users you need for a formative think-aloud evaluation of an early software prototype?

16. Your customer says she wants you to design an information kiosk for an airport terminal, and that it should be "as easy to use as possible". Specify a usability metric (Table 2) that can be used to evaluate your end product. Describe how you would evaluate the metric.

Usability Test Plan (30%)

17. The MBTA hires you to conduct formative usability testing for a new web page they are developing that lets riders report overly-polite people to the Transit Police (part of the "see something, say something" program). The interface lets you upload a digital photo and description of the offending kind act, and specify the station and time the event occurred at.

17a. Post-Task Evaluation (15%) After test users have tried the interface, the customer would like them to be interviewed about their experience (using a semi-structured interview) and administered a quantitative satisfaction measure ("Gotta have some numbers for the boss!"). Write the questionnaire and interview guide (protocol) so that a member of the Transit Police could conduct the evaluation without any training.

Questionnaire

III. Design Problems (25%)

You are hired to head the user experience department of HopTilDrop, a startup that provides route planning and bar recommender services for pub crawl events. The patented technology takes user preferences, budget, alcohol stamina, weather conditions, and preferred start and end times, and plans an optimal series of bars to visit in a specified neighborhood. You are asked to design user interfaces for a desktop Windows application, a web site, and an iPhone.

11a. Sketch the home page of the iPhone app. You can use call-outs to annotate what the most important controls do.

11b. Describe two ways that your iPhone design is likely different from a desktop GUI design.

11b.1.

11b.2.

11c. Describe two ways that your iPhone design is likely different from a web site design.

11c.1.

11c.2.

IV. Usability Test Reports (40%)

Usability Test Report (30%)

You have just completed usability testing on a web-based social support site for survivors of natural disasters ("BetterThanFEMA.com"). The site features discussion groups organized by disaster to let survivors share their stories and tips with each other, in addition to pages of support services and resources and a live chat capability with a professional counselor.

Test Tasks:

T1. Search for drywall repair professionals in New Orleans.

T2. Add a story to the Hurricane Katrina discussion list.

Post-test Questionnaire:

How satisfied were you with the BetterThanFEMA site (circle one number)?

1	2	3	4	5	6	7
Not at all						Very
Satisfied						Satisfied

Data:

Name: Sally Smurf	Age: 19
Sex: female	Education: high school
Disaster experience: Lived in Biloxi, MS during Katrina. House flooded. Computer experience: none.	
T1 completed: Yes	T1 time: 1.2 minutes
T1 errors: 1	
T1 notes: subject could not find resources page link on main page.	
T2 completed: Yes	T2 time: 2.3 minutes
T2 errors: 1	
T2 notes: subject could not recognize the "+" button to add a comment.	
Satisfaction: 6	

Name: Bob Bumble	Age: 32
Sex: male	Education: some high school
Natural disaster experience: None. Computer experience: Minimal.	
T1 completed: Yes	T1 time: 1.4 minutes
T1 errors: 1	
T1 notes: subject could not find resources page link on main page.	
T2 completed: Yes	T2 time: 3.1 minutes
T2 errors: 3	
T2 notes: subject could not find the Katrina discussion link.	
Satisfaction: 7	

Name: Arnold Arbuckle	Age: 38
Sex: male	Education: PhD computer science
Natural disaster experience: None. Computer experience: expert.	
T1 completed: Yes	T1 time: 4 seconds
T1 errors: 0	
T1 notes: subject whistled during the task.	
T2 completed: Yes	T2 time: 1.4 minutes
T2 errors: 0	
T2 notes: subject said he thought the site was poorly designed.	
Satisfaction: 2	

Name: Gertrude Gamer	Age: 25
Sex: female	Education: BA business
Natural disaster experience: Loma Prieta earthquake, San Francisco. Computer experience: fluent	
T1 completed: Yes	T1 time: 52 seconds
T1 errors: 0	
T1 notes: No problems.	
T2 completed: Yes	T2 time: 2.1 minutes
T2 errors: 2	
T2 notes: subject said it was not clear that she could add comments to the discussion.	
Satisfaction: 4	

Name: Tammy Twiddler	Age: 41
Sex: female	Education: GED
Natural disaster experience: Home flooded during hurricane Sandy. Computer experience: None.	
T1 completed: Yes	T1 time: 3.2 minutes
T1 errors: 3	
T1 notes: Subject could not find resources page link on main page.	
T2 completed: No	T2 time: N/A
T2 errors: 7	
T2 notes: Subject could not figure out how to add a comment to discussion.	
Satisfaction: 2	

