**[2] Briefly describe what a prototype is, the goal of prototyping, and give three reasons for why we prototype.**

A prototype is the rapid creation of an approximation to a design idea for the purpose of retrieving feedback and knowledge. The goal of prototyping is to test certain usability requirements. The reasons we prototype are to gain insights into user behavior, communicate ideas to other teammates and stakeholders, and collect data for arguing the best design choice.

**[3] What is the general rule regarding prototyping?** [A] you should always make low-fidelity prototypes when possible as opposed to high-fidelity ones [B] you should progress from low-fidelity to high-fidelity designs throughout the design process [C] you should progress from high-fidelity to low-fidelity designs throughout the design process [D] you should always make high-fidelity prototypes when possible as opposed to low-fidelity ones

**[4] Suppose you are designing an application in which users can locate less-crowded and vacant study spaces to work in. Your app works similar to a search engine, where users are able to specify the location (E-School, on-grounds, corner, etc.), the vacancy (crowded, average number of people, empty), and the noise level (loud, average, silent). Create a storyboard with an appropriate number of panels to show a user’s interaction with the app and actions in real-life.**

Box with dropdown menu, box with vacancy, user choosing 3 inputs, walk to place, user sees it’s not crowded (yay happy now)

**[5] Briefly explain the difference between low- and high-fidelity prototypes, and give two advantages and disadvantages of using each.**

Low fidelity: Cheap, less time consuming, no high-tech: paper, videos; user might not understand what you’re going for, might not understand relation,

High fidelity: takes more time, more expensive, more realistic, more high tech, may test more usability requirements

**[6] Which is more important during the design process: quantity (producing as many prototypes as possible) or quality (producing more usable, high-fidelity prototypes)? Argue which one you think is more important and give an explicit example that supports your claim.**

It depends on where you are in the design process. Quantity is more important early in the design process so you can test some usability requirements and have a good idea of your application so that you don’t lose too much money by making mistakes later on. High fidelity prototypes are important towards the end in the design process to test other usability requirements and so that the feedback will be relatable to the actual final product.

**[7] Suppose you are creating a mobile application called “Jennie the Pocket TA” that aims to help students be more successful in their classes. “Jennie,” is able to answer a large majority of the questions posed by students regarding information found in the syllabus, in lecture, and in the textbook. Your goal is to learn how to most effectively use natural language processing, so that Jennie can understand text input from a user and respond appropriately. Which prototyping technique would you use to simulate this interaction between “Jennie” and the user? Describe how you would set up this prototype and test it on users.**

We would use a wizard. We would give a human a specific set of things that could be said to specific key words. We would tell the user the purpose of Jennie and have them ask her questions.

**[8] Briefly explain the phenomenon of functional fixation along with how you, as a designer, can try to overcome it.**

Functional fixation is when a designer only thinks an object can be used as its original purpose. Think of the in-class example with the candle and match box. The solution involves using the match box to hold the candle. Basically, think of other uses for ordinary objects!

**[9] After we create prototypes, what is the purpose we have in testing them?**

Test usability requirements! Making sure it works how you want, making sure the user’s conceptual model matches the designers

**[10] Explain why you should never ask “Do you like my interface?” when having users evaluate a prototype. Give examples of two other questions that you should ask instead.**

Leading question; bias; “my” makes it personal; interface is a high tech word

“Did you have any issues performing any tasks with this application?”

“Rate how much you like this application on a scale of 1-5.”

**[11] What is the difference between internal and external validity, and in which situations should each be used?**

External validity applies outside the experiment and sample, while internal validity is only valid within the sample. External is good for natural settings, while internal is good in experimental settings.

**[12] Briefly explain what the “think aloud” method is and how it is used in the context of evaluating prototypes. Give two advantages and two disadvantages of this method.**

Users speak freely while performing tasks. This allows the observer to hear the user’s train of thought which will help for task analysis. This will allow the observer to know what the user is thinking. You know what the observer doesn’t know how to do. Can hear their troubles, what they know and don’t know. Saying everything is kind of weird. Might not be comfortable. Non-trivial thinking will distract them.

**[13] In the figure below for the Fisher’s Exact Test, explain what is represented by each of the values: a, b, c and d.**

“expected” is from chance

**[14] If we ran a well-formed experiment and applied Fisher’s Exact Test with the result being p = 5%, what would be the conclusion that we should make from the experimental results?**

If we assume a significance level of 10%, we would say that what happened did not occur by chance.

**[15] A designer decides to test their prototype on a number of users. The designer asks users to rate the app’s overall intuitiveness and ease-of-use on a Likert scale from 1 to 5 (1 – not at all intuitive, 2 – somewhat difficult to use, 3 – neutral, 4 – easy to use, 5 – very intuitive). Some other information is recorded when the user takes the survey like the outside temperature and the time of day. The designer ends up with the graph shown below. The designer concludes that the outside temperature has an effect on the ratings that users give the application. The designer recommends that the app be used in the mid-afternoon when the temperature is the highest, so that more people will find the app easy to use. What is wrong with this conclusion? Name and briefly describe a statistical test that could be used to verify the hypothesis that there is a correlation in the data.**

Null hypothesis: Likert and weather are not related; he is confusing correlation with causation. We should perform a t-test/Fisher test