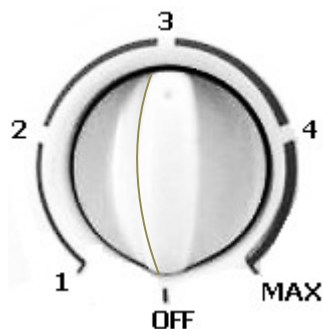
	Course Name:	Human Computer Interaction	Course Code:	CS 422
	Program:	CS	Semester:	Spring 2018
	Duration:	2 Hr 30 Minutes	Total Marks:	75
	Paper Date:	21-MAY-18	Weight	40
	Section:	C and F	Page(s):	7
	Exam Type:	FINAL		

Student : Name: _____ **Roll No.** _____
Section: _____

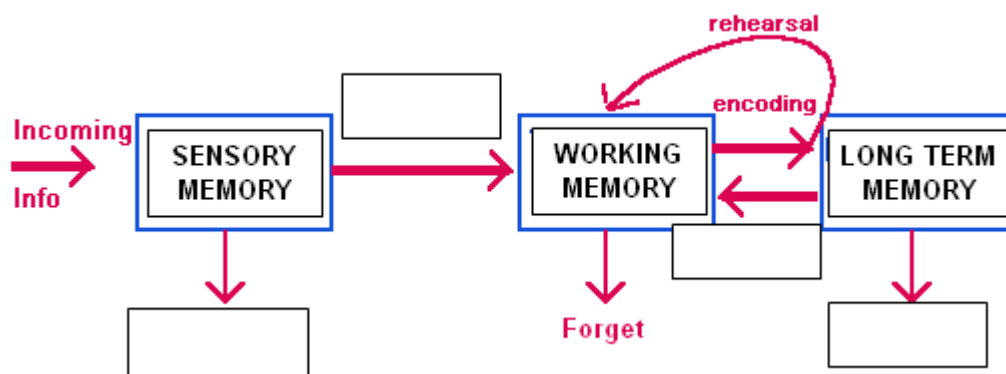
Instruction/Notes: No rough sheets!

1. [10] A development team has created a new version of an existing smart watch user interface. Two important requirements that the new interface should be both efficient and intuitive. How would you assess the efficiency and intuitiveness in light of your knowledge from the chapter navigation and screen design (Basic principles of proper UI) chapter 05 Alan Dix.
2. [2] What is affordances in UI design? Give an example from daily life.
3. [2] Why visual angle cannot be used to determine the size of an object? Explain with the help of a figure.

4. [5] Consider the following physical control of a thermostat of a refrigerator. When you rotate it to the right cooling of refrigerator increases while to the left the cooling decreases. Your task is to draw an appropriate glass interface for it.



5. [4] Consider the interaction of 3 different types of human memory shown below. Provide appropriate labels (4) for the unlabeled arrows coming out of sensory, working and long term memory in the space provided.

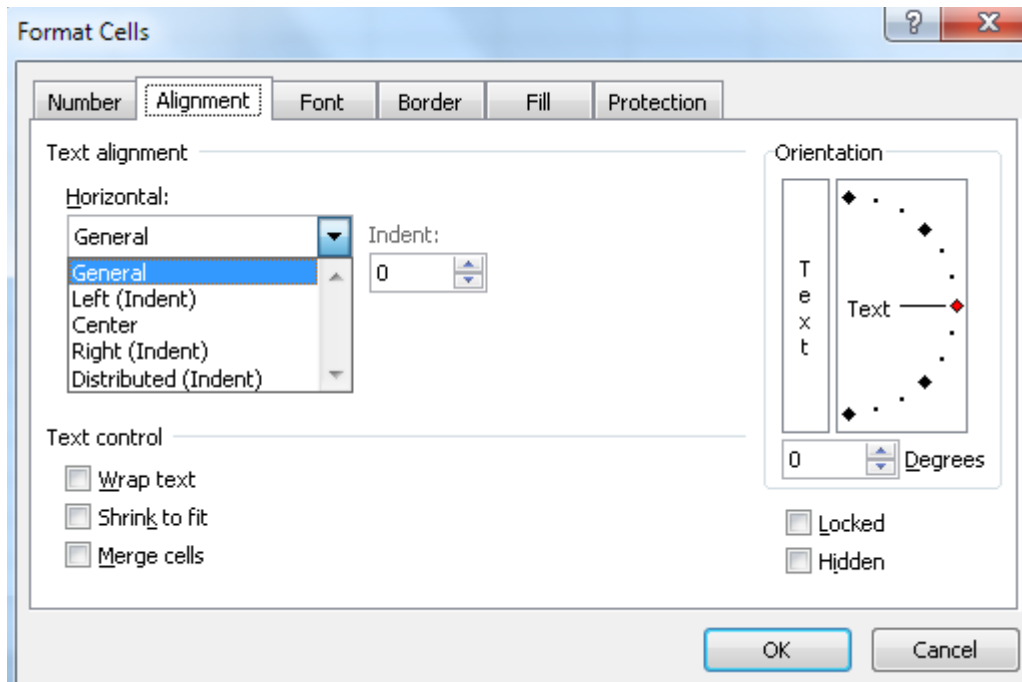


6. [10] A mobile application named Amazing Restaurant Indicator (ARI) is being developed for the user category “Head of family”. ARI is a GPS-based mobile application which helps people to find the closest restaurants based on the user’s current position and other specifications. A head of the family will have a profile on it and when the family decides to go to a restaurant he/she finds the restaurant on it. You are given **the Task Analysis** for “**Find a restaurant**” task and the results of **user profiling**.

Actor (User)	Task	Scenario
Head of the family (HOF)	Find a restaurant	<ol style="list-style-type: none">1. HOF enters the specifications like price, restaurant type, dish, seating capacity and ratings.2. ARI shows a list of nearby restaurants using the specifications given.3. Next to the restaurant, the approximate travel time, waiting time and each restaurant’s official website address is shown.4. HOF can also view the history of their visits to a restaurant visible in search results. History includes the date of visit and their own comments on that visit.5. HOF can share his/her views on Facebook about the restaurant through ARI.6. HOF can get recommendations regarding the restaurant from his/her family members connected with him/her on ARI.

Using the information given above, develop a **Conceptual Model Design (full sketch)** for the task “**Find a restaurant**” of ARI. You need to make ONE model only.

7. [10] Consider the MS Excel Format Cell Dialog box in the figure. You want to select the horizontal text alignment as Center. You want to wrap text, keep it locked. As a user, you always move from field to field using a mouse. You want to set the degree to 145 by typing in the Degrees field. Assume your hand is initially on the mouse and currently “General” option is selected. Also assume that this dialog box is dismissed by clicking the “OK” button at the end using a mouse. Using KLM-GOMS, determine the minimum time needed to perform this task in seconds. Note $K = 0.2s$, $P = 1.1s$, $H = 0.4s$ and $M=1.35s$. **Show all intermediate steps.**



8. [4] Explain with reference to a law discussed in class why it is faster to execute a command to warm an item in the microwave for 33 seconds, than it is to execute a command for 30 seconds, for the given microwave touch keypad shown below. Make sure to name the law and describe the law in plain language.

7	8	9
4	5	6
1	2	3
0	START	

- a. [1] State the relevant Law:
- b. [1] Describe the law in plain language in 2-3 sentences ONLY
- c. [2] Explain why it is faster to use 33 seconds instead of 30 seconds. Your explanation should not be more than 3-4 sentences. If longer, the answer might not be checked.

9. [12] Indicate which input and output device (or mechanism) should be used for each of the following systems. Justify your answers.

- a. A mobile application for kids 3-4 years of age

Input Device:

Justification:

Output Device:

Justification:

- b. A watch like device that counts exercise minutes

Input Device:

Justification:

Output Device:

Justification:

- c. In-car audio entertainment system

Input device:

Justification:

Output device:

Justification:

10. [6] Suggest how each of the following issues can be accounted for in the light of The Abowd-Beale's Interaction Framework. Specify which translation discussed in this theory best explains the behavior of the system and why.

- a. The user sees a bank of unlabeled switches. The user has no idea which switch controls the lights at the far end of the room.

Translation:

Why?

- b. Consider a remote control for a television without a button for turning off the television. The user must go directly to the device and turn it off on the control panel.

Translation:

Why?

- c. A graph shows the count of grades given in a particular course. The components in the graph are not labeled.

Translation:

Why?

11. [10]

- a. [1] Briefly discuss one architectural design flaw in FAST University, Lahore. How can we resolve that design flaw?

b. [4] You are working on improving the usability of a horizontal toolbar in a word processing application. The toolbar consists of a single row of twelve 16x16-pixel icons. Using Fitts' Law, answer the following question:

- i. In 2-3 sentences, list two ways to make the toolbar faster and easier to use and use Fitts' Law to explain why these will make the toolbar more usable.

- ii. Are circular menu popups better compared to linear popup menus? Explain in 2-3 sentences.

c [3] Using the Fitt's law, calculate the time it will take to hit the target (i.e. rectangle) shown in the figure below. Various measurements (in pixels) are given in the figure. Use the appropriate ones to calculate the time. Assume that the value of all coefficients used in Fitt's law is 1. **There is no partial credit for this question. Show all intermediate steps.**

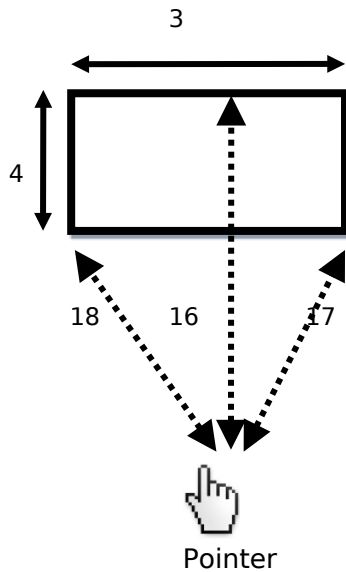


Image is NOT drawn to scale.

d. [2]

A user is playing a memory game that is designed as follows: it first asks the user to memorize a set of names and then, without any delay, it asks the user to memorize another set of names. At the end the user is asked to remember all names from both sets. The user does not perform well in either set. Which memory is this game testing and why doesn't the user perform well. Explain in 1 sentence ONLY.

Memory:

Explanation: