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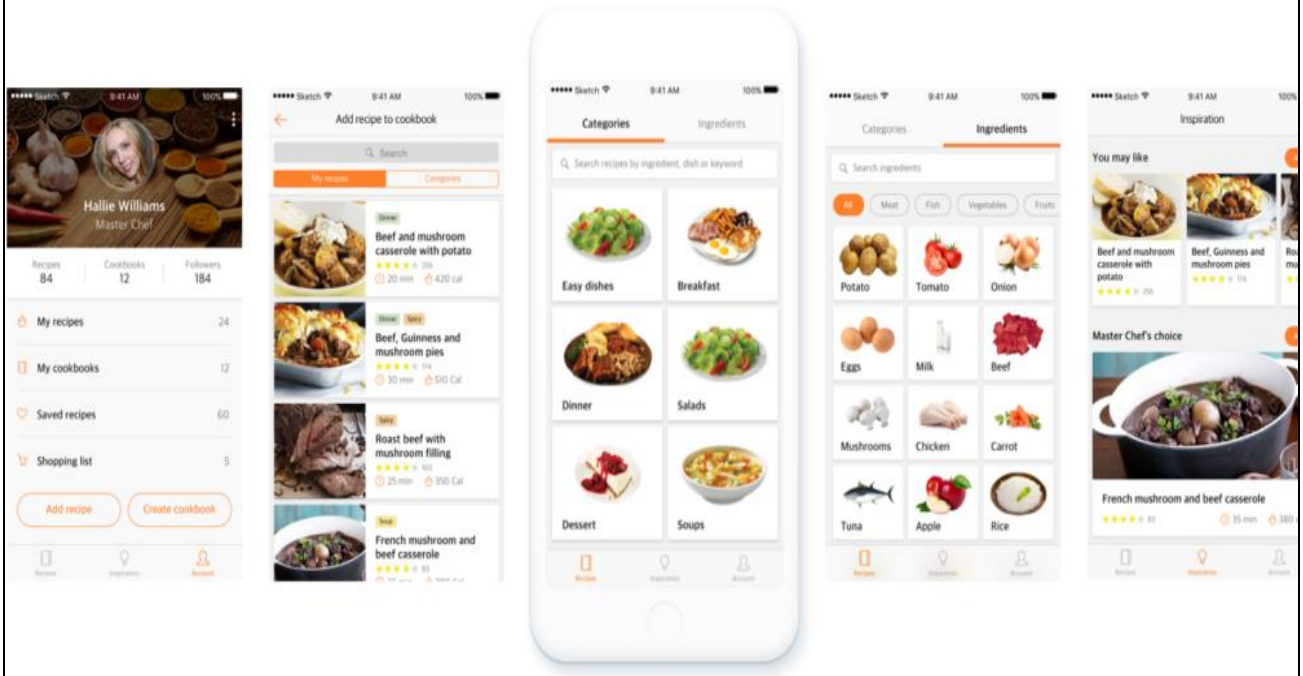
Sub:	USER INTERFACE DESIGN					Sub Code:	18CS734	Branch:CSE
Date:	31/10/2023	Duration:	90 mins	Max Marks:	50	Sem/Sec:	VII A,B,C	

Answer any FIVE FULL Questionns

1.	Explain the various characteristics of a successful GUI. The various characteristics of GUI are as follows: 1. Sophisticated Visual Presentation (2M) Visual presentation is the visual aspect of the interface. The sophistication of a graphical system permits displaying lines, including drawings and icons. The meaningful interface elements visually presented to the user in a graphical system include o Windows - primary, secondary, or dialog boxes o Menus - menu bar, pull-down, pop-up, cascading o Icons - represent objects such as programs or files 2. Pick-and-Click Interaction (1M) To identify a proposed action is commonly referred to as pick, the signal to perform an action as click. 3. Restricted Set of Interface Options (1M) The array of alternatives available to the user is what is presented on the screen or what may be retrieved through what is presented on the screen, nothing less, and nothing more. This concept fostered the acronym WYSIWYG. 4. Visualization (2M) Visualization is a cognitive process that allows people to understand information that is difficult to perceive, because it is either too voluminous or too abstract. The best visualization method for an activity depends on what people are trying to learn from the data. The goal is not necessarily to reproduce a realistic graphical image, but to produce one that conveys the most relevant information. Effective visualizations can facilitate mental insights, increase productivity, and foster faster and more accurate use of data. 5. Object Orientation (1M) A graphical system consists of objects and actions. Objects are what people see on the screen as a single unit. Objects can be composed of sub objects. 6. Use of Recognition Memory (1M) Continuous visibility of objects and actions encourages use of a person's more powerful recognition memory. The "out of sight, out of mind" problem is eliminated. 7. Concurrent Performance of Functions (2M) o Graphic systems may do two or more things at one time. Multiple programs may run simultaneously. o When a system is not busy on a primary task, it may process background tasks (cooperative multitasking). When applications are running as truly separate tasks, the system may divide the processing power into time slices and allocate portions to each application (preemptive multitasking) o Data may also be transferred between programs. It may be temporarily stored on a "clipboard" for later transfer or be automatically swapped between programs.	[10]

2(A) Compare and contrast GUI and WUI. **(any 5 each 1M)** [5]

Sl.No	Characteristics	GUI	WEB
1	Devices	User hardware variations limited.User hardware characteristics well defined Screens appear exactly as specified.	User hardware variations enormous. Screen appearance influenced by hardware being used.
2	User Focus	Data and applications.	Information and navigation.
3	Data	Typically created and used by known and trusted	Full of unknown content.
4	Information	Sources are trusted. Properties generally known. Typically placed into system by users or known people and organizations.	Source not always trusted. Often not placed onto the Web by users or known people and organizations. Highly variable organization.
5	User Tasks	Install, configure, personalize, start, use, and Open, use, and close data files. Familiarity with applications often achieved.	Link to a site, browse or read pages, fill out forms, upgrade programs. register for services, participate in transactions, download and save things. Familiarity with many sites not established.
6	Presentation	Windows, menus, controls, data, toolbars Presented as specified by designer. Generally standardized by toolkits and style specifications guides.	Two components, browser and page. Within page, any combination of text, images, audio, video, and animation. May not be presented as specified by the designer dependent on browser, monitor, and user Little standardization.
7	Navigation	Through menus, lists, trees, dialogs, and wizards.	Through links, bookmarks, and typed URLs.
8	Interaction	Interactions such as clicking menu choices, pressing buttons, selecting list choices, and cut/copy/paste occur within context of active program.	Basic interaction is a single click. This can cause extreme changes in context, which may not be noticed.
9	User Assistance	Integral part of most systems and applications. Documentation, both online and offline, Customer service support, if provided, usually provided. Personal support desk also usually provided.	No similar help systems. Accessed through standard mechanisms. The little available help is built into the page oriented to product or serviceoffered.
10	Integration	Seamless integration of all applications into the platform environment is a major objective.	Apparent for some basic functions within most Web sites (navigation, printing, and so on.) in accomplishing this objective Sites tend to achieve individual distinction rather than integration.

2(B)	Design a UI for the below scenario: **Redesigning an Cooking Application.** While having dinner with his family, designer Vitaly Dulenko thought of creating an application that could advise him what to cook. He thought how amazing it would be if you'd pick ingredients from your refrigerator and get some recipes instantly. He wrote the user flow to add the following three crucial functionalities: • Finding interesting recipes quickly • Search for and edit the ingredient you've chosen • Adding your ingredients and recipes He created paper prototypes of the cooking app and validated them by user testing. After testing and concluding the findings of his case study, he came up with a clean and light UI design. Key highlights: • Find interesting recipe • Select available ingredients • Define ingredient using search option • Select recipe with highest rating • Share your views regarding the case study about the designing process, how convenient it will be for users. **Analysis of Case Study- 2 Marks** **Design of case study – 3 Marks** **(Similar design)** 	[5]

3(A)	Are there any obstacles in the development path of design process? List if any. Also explain how these obstacles can be overcome. Obstacles – 3M Overcoming the obstacles – 2M Yes, there are few obstacles in the path of design process. Few obstacles noted by Goulde are as follows: - Nobody ever gets it right the first time. - Development is chock-full of surprises. - Good design requires living in a sea of changes. - Making contracts to ignore change will never eliminate the need for change. - Even if you have made the best system humanly possible, people will still make mistakes when using it. - Designers need good tools. - You must have behavioral design goals like performance design goals. Obstacles will always be existed in the development path where it can be reduced using the following commandments o Gain a complete understanding of users and their tasks o Solicit early and ongoing user involvement o Perform rapid prototyping and testing o Modify and iterate the design as much as necessary o Integrate the design of all the system components	[5]
3B	Briefly explain the practical and objective criteria for measuring usability. Practical measures – 3M 1. Are people asking a lot of questions or often reaching for a manual? 2. Are frequent exasperation responses heard? 3. Are there many irrelevant actions being performed? 4. Are there many things to ignore? 5. Do a number of people want to use the product? Objectives – 2M 1. How effective is the interface? Can the required range of tasks be accomplished 2. How learnable is the interface? Can the interface be learned 3. How flexible is the interface? Is it flexible enough to 4. What are the attitudes of the users? Are they	[5]

4.	Humans are complex organisms with variety of attributes that have impact on interface and screen designs. Justify and explain.
	
	Important Human Characteristics in Design – Each characteristics 1M
	
	• **Perception (1M)**
	  ○ Proximity
	  ○ Similarity
	  ○ Matching patterns
	  ○ Succinctness
	  ○ Closure
	• **Memory (1M)**
	  ○ long-term memory
	  ○ short-term (or working) memory
	• **Sensory Storage (1M)**
	Sensory storage is the buffer where the automatic processing of information collected from our senses takes place. It is an unconscious process, large, attentive to the environment, quick to detect changes, and constantly being replaced by newly gathered stimuli.
	• **Visual Acuity (1M)**
	The capacity of the eye to resolve details is called visual acuity
	• **Foveal and Peripheral Vision (1M)**
	Foveal vision is used to focus directly on something; peripheral vision senses anything in the area surrounding the location we are looking at, but what is there cannot be clearly resolved because of the limitations in visual acuity just described
	• **Information Processing (1M)**
	The information that our senses collect that is deemed important enough to do something about then has to be processed in some meaningful way.
	• **Mental Models (1M)**
	A mental model is simply an internal representation of a person's current understanding of something
	• **Movement Control (1M)**
	Once data has been perceived and an appropriate action decided upon, a response must be made; in many cases the response is a movement
	• **Learning (1M)**
	Learning, as has been said, is the process of encoding in long-term memory information that is contained in short-term memory
	• **Skill (1M)**
	The goal of human performance is to perform skillfully. To do so requires linking inputs and responses into a sequence of action
	• **Individual Differences**
	A complicating but very advantageous human characteristic is that we all differ—in looks, feelings, motor abilities, intellectual abilities, learning abilities and speed, and so on.
		[10]

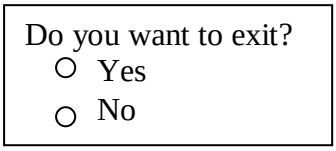
5.	Explain the structure of menus with user designed examples for each.	[10]

Menus vary in form from very simple to very complex. They may range from small dialog boxes requesting the user to choose between one of two alternatives, to hierarchical tree schemes with many branches and level of depth. A menu's structure defines the amount of control given to the user in performing a task. The most common structures are the following:

Single Menus: (1M)

A single screen or window is presented to seek the user input or requests an action to be performed.

Eg:



Sequential Linear Menus: (2M)

Sequential linear menus are presented on a series of screens possessing only one path.

The menu screens are presented in a preset order, and, generally, their objective is for specifying parameters or for entering data.

Eg:

Simultaneous Menus: (2M)

Instead of being presented on separate screens, all menu options are available simultaneously. The menu may be completed in the order desired by the user, choices being skipped and returned to later. All alternatives are visible for reminding of choices, comparing choices, and changing answers.

Eg:

Hierarchical Menus (2M)

A hierarchical structure results in an increasing refinement of choice as menus are stepped through, for example, from options, to sub-options, from categories to subcategories, from pages to sections to subsections, and so on.

Eg:

Connected Menus: (2M)

Connected menus are networks of menus all interconnected in some manner. Movement through a structure of menus is not restricted to a hierarchical tree, but is permitted between most or all menus in the network.

Eg:

Event-Trapping Menus (1M)

Event Trapping menus provide an ever-present background of control over the system's state and parameters while the user is working on a foreground task.

Eg:

6	Describe the various formats to be followed during the development of system menus. Each characteristics – 1M **Consistency (1M)** Formatting, including organization, presentation, and choice ordering. Phrasing, including titles, choice descriptions, and instructions. Choice selection methods. Navigation schemes **Display (1M)** If continual or frequent references to menu options are necessary, permanently display the menu in an area of the screen that will not obscure other screen data. **Presentation (1M)** Ensure that a menu and its choices are obvious to the user by presenting them with a unique and consistent structure, location, and/or display technique **Organization (2M)** Match the menu structure to the structure of the task Minimize number of menu levels within limits of clarity Be conservative in the number of menu choices presented on a screen With logical groupings of elements, limit choices to 18 to 24 **Items arrangement (1M)** Align alternatives or choices into single columns whenever possible Organize for left-to-right reading **Complexity (1M)** Provide both simple and complex menus. Simple: a minimal set of actions and menus. Complex: a complete set of actions and menus **Ordering (1M)** Order lists of choices by their natural order, or For lists associated with numbers, use numeric order **Grouping (1M)** Create groupings of items that are logical, distinctive, meaningful, and mutually exclusive. Categorize them in such a way as to: Maximize the similarity of items within a category. Minimize the similarity of items across categories. **Line separators (1M)** Separate vertically arrayed groupings with subtle solid lines. Separate vertically arrayed sub groupings with subtle dotted or dashed lines	[10]