

**MARIA COLLEGE OF ENGINEERING AND TECHNOLOGY,
ATTOOR**

DEPARTMENT OF INFORMATION TECHNOLOGY
IT604 USER INTERFACE DESIGN
2 MARKS QUESTIONS & ANSWERS

UNIT-I

PART-A

1. Define user interface? What are the two components in user interface?

User interface is the part of a computer & its software that people can see, hear, touch, talk to or otherwise understand or direct

User interface has 2 components.

1.Input :- how a person communicates his or her needs
to the computer.

2.Output :- how computer conveys the results of its
Computations & requirements to the user.

2. What is meant by GUI?

GUI may be defined as follows,

- A user interface is a collection of techniques & mechanisms to interact with something.
- A graphical Interface , the primary interaction mechanism is the pointing device of some kind.
- This device is the electronic equivalent to the human hand.

3. What is an object? Explain its types?

Objects are what people see on the screen. They are manipulated as a single unit. A well-designed system keeps users focused on objects, not on how to carry out actions. Objects can be composed of sub objects.

Types are

- Data objects:- present information.
- Container objects:- are objects to hold other objects.

- Device objects:- represents physical objects in the real world, such as printers or trash baskets.

4. Define property attribute specification? Explain its sequence?

Property/Attribute specification actions establish or modify the attributes or properties of objects. When selected, they remain in effect until deselected.

The following are the sequences,

- The user selects an object.
- The user then selects an action to apply to that object, such as the action BOLD.
- The selected words are made bold and will remain bold until selected and changed again.

5. Define concurrent performance of function?

Graphical system may do two or more things at one time. Multiple pgms may run simultaneously. When a system is not busy on a primary task, it may process background task (cooperative multi tasking). When applications are running as truly separate tasks, the system may divide the processing power into time slices & allocated portions of each application (preemptive multi tasking).

6. Define Pick & Click interaction?

Elements of a graphical screen upon which some action is to be performed must first be identified.

The motor activity required of a person to identify this element for a proposed action is called as "pick" to signal to perform an action is called as "click"

7. What is User Assistance in Web Interface Design?

Web pages do not provide similar help systems. What little help that is available is built into the page. Customer service support, if provided, is generally oriented to the product or service offered.

8. Write a note on consistency?

- * A system should look, act, and operate the same throughout. Similar components should,
 - Have a similar look.
 - Have similar uses.
 - Operate similarly.

- * The same action should always yield the same result.
- * The function of elements should not change.
- * The position of standard elements should not change.

9. Explain the types of compatibility?

Types are as follows,

- User compatibility – Effective design starts with understanding the user’s needs & adopting the user’s point of view.
- Task & job compatibility - The organization of a system should match the tasks a person must do to perform the job.
- Product compatibility – Compatibility across products must always be considered in relation to improving interfaces, making new systems compatible with existing systems will take advantage of users what they know already & reduce the necessity for new learning.

10. Explain 5 ways to provide simplicity ?

- Use progressive disclosure, hiding things until they are needed.
 - * Present common & necessary function first.
 - * Prominently feature important features.
 - * Hide more sophisticated & less frequently used function.
- Provide defaults.
- Minimize screen alignment points.
- Make common actions being made harder.
- Provide uniformity & consistency.

11. What is meant by Transparency?

Permit the user to focus on the task or job without concern for the mechanics of the interface.

Workings & remainders of workings inside the computer should be invisible to the user.

12. What is visualization?

- * 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.
- * It involves changing an entity’s representation to reveal gradually the structure & function of the underlying system or process.

13. List the principle of User Interface Designs?

* Interface is just an extension of a person. This means that the system & its software must reflect a person's capabilities & respond to his/her specific needs.

* Interface serves as both connector & separator: a connector is that it ties the user to the power of the computer, & a separator in that it minimizes the possibility of the participants damaging one another.

14. What are the characteristics of direct manipulation?

- * The system is portrayed as an extension of the real world.
- * Continuous visibility of object & actions
- * Actions are rapid and incremental with display of results.
- * Incremental actions are easily reversible.

15. What is Response Time in Web Interface Design?

Quite variable, depending on transmission speeds, page content, and so on. Long times can upset the user.

16. List the principles for the Xerox STAR?

- * The illusion of manipulatable objects.
- * Visual order & viewer focus.
- * Revealed structure.
- * Consistency.
- * Appropriate effect or emotional impact.
- * A match with the medium.

17. What is meant by Trade –offs?

Final design will be based on a series of trade-offs balancing the often conflicting design principles.

People's requirements always take precedence over technical requirements.

18. Write a note on Forgiveness?

It is often said "to err is human." The corollary to that statement, at least in computer systems, might be "to forgive is good design." People will make mistakes; a system should tolerate those that are common and unavoidable. A forgiving system keeps people out of trouble.

19. Define page rendering?

Printed pages are immensely superior to Web pages in rendering. Printed pages are presented as complete entities, and their contents are available for reading or review immediately upon appearance.

20. What is Aesthetically Pleasing?

A design aesthetic, or visually pleasing composition, is attractive to the eye. It draws attention subliminally, conveying a message clearly and quickly. Visual appeal makes a computer system accessible and inviting.

PART-B

1) Explain briefly about the characteristics of GUI?

Characteristics of GUI:

1. SOPHISTICATED VISUAL PRESENTATION
2. PICK-AND-CLICK INTERACTION
3. RESTRICTED SET OF INTERFACE OPTIONS
4. VISUALIZATION
5. OBJECT ORIENTATION
 - PROPERTIES OR ATTRIBUTES OF OBJECTS
 - ACTIONS
 - APPLICATION VERSUS OBJECT OR DATA ORIENTATION
6. VIEWS
7. USE OF RECOGNITION MEMORY
8. CONCURRENT PERFORMANCE OF FUNCTIONS

2) Mention the advantages & disadvantages of GUI in detail.

Advantages:

- SYMBOLS RECOGNIZED FASTER THAN TEXT
- FASTER LEARNING
- FASTER USE AND PROBLEM SOLVING
- EASIER REMEMBERING
- MORE NATURAL
- EXPLOITS VISUAL/SPATIAL CUES
- FOSTERS MORE CONCRETE THINKING
- PROVIDES CONTEXT
- FEWER ERRORS
- INCREASED FEELING OF CONTROL
- IMMEDIATE FEEDBACK
- PREDICTABLE SYSTEM RESPONSES
- EASILY REVERSIBLE ACTIONS
- LESS ANXIETY CONCERNING USE
- MORE ATTRACTIVE
- MAY CONSUME LESS SPACE
- REPLACES NATIONAL LANGUAGES

- EASILY AUGMENTED WITH TEXT DISPLAYS
- LOW TYPING REQUIREMENTS
- SMOOTH TRANSITION FROM COMMAND LANGUAGE SYSTEM

Disadvantages:

- GREATER DESIGN COMPLEXITY
- LEARNING STILL NECESSARY
- LACK OF EXPERIMENTALLY-DERIVED DESIGN GUIDELINES
- INCONSISTENCIES IN TECHNIQUE AND TERMINOLOGY
- WORKING DOMAIN IS THE PRESENT
- NOT ALWAYS FAMILIAR
- HUMAN COMPREHENSION LIMITATIONS
- WINDOW MANIPULATION REQUIREMENTS
- PRODUCTION LIMITATIONS
- FEW TESTED ICONS EXIST
- INEFFICIENT FOR TOUCH TYPISTS
- INEFFICIENT FOR EXPERT USERS
- NOT ALWAYS THE PREFERRED STYLE OF INTERACTION
- NOT ALWAYS FASTEST STYLE OF INTERACTION
- INCREASED CHANCES OF CLUTTER AND CONFUSION
- THE FUTZ AND FIDDLE FACTOR
- MAY CONSUME MORE SCREEN SPACE
- HARDWARE LIMITATIONS

3)Write a detailed note on characteristics of Web User Interface?

CHARACTERISTICS OF WEB USER INTERFACE

1.GUI VERSUS WEB PAGE DESIGN

- DEVICES
- USER FOCUS
- DATA/INFORMATION
- USER TASKS
- USER'S CONCEPTUAL SPACE
- PRESENTATION ELEMENTS
- NAVIGATION
- CONTEXT
- INTERACTION
- RESPONSE TIME
- VISUAL STYLE
- SYSTEM CAPABILITY
- TASK EFFICIENCY

- CONSISTENCY
- USER ASSISTANCE
- INTEGRATION
- SECURITY
- RELIABILITY

2.PRINTED PAGES VERSUS WEB PAGES

- PAGE SIZE
- PAGE RENDERING
- PAGE LAYOUT
- PAGE RESOLUTION
- USER FOCUS
- PAGE NAVIGATION
- SENSE OF PLACE
- INTERACTIVITY
- PAGE INDEPENDENCE

4)Explain the general principles of UID?

GENERAL PRINCIPLES

1. AESTHETICALLY PLEASING

- PROVIDE VISUAL APPEAL BY FOLLOWING THESE PRESENTATION AND GRAPHIC DESIGN PRINCIPLES:
 - PROVIDE MEANINGFUL CONTRAST BETWEEN SCREEN ELEMENTS
 - CREATE GROUPINGS
 - ALIGN SCREEN ELEMENTS AND GROUPS
 - PROVIDE THREE-DIMENSIONAL REPRESENTATION
 - USE COLOR AND GRAPHICS EFFECTIVELY AND SIMPLY

2. CLARITY

- THE INTERFACE SHOULD BE VISUALLY,CONCEPTUALLY,AND LINGUISTICALLY CLEAR,INCLUDING:
 - VISUAL ELEMENTS
 - FUNCTIONS
 - METAPHORS
 - WORDS AND TEXT

3. COMPATIBILITY

- PROVIDE COMPATIBILITY WITH THE FOLLOWING:
 - THE USER

- THE TASK AND JOB
- THE PRODUCT
- ADOPT THE USER'S PERSPECTIVE

4. **COMPREHENSIBILITY**

- A SYSTEM SHOULD BE EASILY LEARNED AND UNDERSTOOD.A USER SHOULD KNOW THE FOLLOWING:
 - WHAT TO LOOK AT
 - WHAT TO DO
 - WHEN TO DO IT
 - WHERE TO DO IT
 - WHY TO DO IT
 - HOW TO DO IT
- THE FLOW OF ACTIONS,RESPONSES,VISUAL PRESENTATIONS,AND INFORMATION SHOULD BE IN A SENSIBLE ORDER THAT IS EASY TO RECOLLECT AND PLACE IN CONTEXT

5. **CONFIGURABILITY**

- PERMIT EASY PERSONALIZATION,CONFIGURATION,AND RECONFIGURATION OF SETTINGS.
 - ENHANCES A SENSE OF CONTROL.
 - ENCOURAGES AN ACTIVE ROLE IN UNDERSTANDING.

6. **CONSISTENCY**

- A SYSTEM SHOULD LOOK,ACT AND OPERATE THE SAME THROUGHOUT.SIMILAR COMPONENTS SHOULD:
 - HAVE A SIMILAR LOOK
 - HAVE SIMILAR USES
 - OPERATE SIMILARLY
- THE SAME ACTION SHOULD ALWAYS YIELD THE SAME RESULT
- THE FUNCTION OF ELEMENTS SHOULD NOT CHANGE
- THE POSITION OF STANDARD ELEMENTS SHOULD NOT CHANGE

UNIT-II

PART-A

1) **What is meant by visual Acuity ?**

The capacity of the eye to resolve details is called visual acuity. it is the phenomenon that results in an object becoming more distinct as we turn our eyes toward it and rapidly losing distinctness as we turn eyes away that is as the visual angle from the point of fixation increases.

it has been shown that relative visual acuity is approximately halved at a distance of 2.5 degrees from the point of eye fixation.

2) What is meant by short term and long term memory ?

SHORT-TERM MEMORY

Short-term memory a limited amount of information processing takes place. Information stored within it is variously thought to last from 10 to 30 seconds, with the lower number being the most reasonable speculation.

LONG-TERM MEMORY

Long term memory contains the knowledge we possess. Information received in short term memory is transferred to it and encoded within it, a process we call learning.

3) Explain direct method in requirement analysis?

The significant advantage of the direct methods is the opportunity they provide to hear the user's comments in person and firsthand. person-to-person encounters permit multiple channels of communication and provide the opportunity to immediately up on vague or incomplete data.

4) Explain indirect method in requirement analysis ?

An indirect method of requirements determination is one that places an intermediary between the developer and the user. this intermediary may be electronic or another person. Using an intermediary can certainly provide useful information.

5) Write a note on groupings ?

Provide functional groupings of associated elements.

- create spatial groupings as closely as possible as possible to five degrees of visual angle.
- Evenly space controls within a grouping allowing 1/8 to 1/4 inch between each.
- Visually reinforce groupings:
 - provide adequate separation between groupings through liberal use of white space.
 - provide line borders around groups.
 - provide meaningful titles for each groupings.

6) What are perceptual principles used to create functional groupings ?

(i).use visual organization to create functional groupings.

-proximity -- 000 000 000

-similarity: -- AABBBCCC

-closure: -- [] [] []

-matching patterns: -->> <>

(ii).combine visual organization principles in logical ways.

-proximity and similarity --AAA BBB CCC

-proximity and closure --[] [] []

-matching patterns and closure: --() <> ()

-proximity and ordering: --1234 1 5

(iii)Avoid visual organization principles that conflict

-proximity opposing similarity --AAA ABB BBc CCC

-proximity opposing closure --D)({ } []

-proximity opposing ordering --2468 3 5

7) List the guidelines to be followed for scrolling & paging?

SCROLLING:

Avoid to determine a pages, contents, minimize vertical page scrolling. when vertical scrolling is necessary to view an entire page. provide contextual cues within the page that it must be scrolled to view its entire contents. provide a unique page scrolling.

PAGING:

Encourage viewing a page through “paging”. create a second version of a web site, one consisting of individual screens that are viewed through “paging”.

8) List the guidelines to be followed for font types & families?

Use simple, common, readable fonts. any sans serif such as Helvetica or verdana, times roman use no more than two families, compatible in terms of line thickness, capital letter height., and so on. assign a separate purpose to each family. allow one family to dominate.

9) List the guidelines to be followed for font styles & weight ?

Use no more than two styles of the same family such as standard and italic, italic is best presented in a serif font. provide two weights such as regular and bold, bold is best presented in a sans serif font. use italic when you want to call attention. use bold when you want to call attention or hierarchy. in web pages use an underline only to indicate a navigation link.

10) List the guidelines to be followed for control section heading?

Provide a meaningful heading that clearly describes the relationship of the grouped controls. locate section headings above this related screen controls, separated by one space line. indent the control caption to the right of the start of the heading. fully spell out in a uppercase font. display in normal intensity.

11) List the guidelines to be followed for field group heading?

Provide meaningful heading that clearly describes the relationship of the grouped controls. center the field group heading above the captions to which applies. relate it to the captions by a solid line. fully spell it out in a uppercase font. display it in the normal intensity.

12) What is mean by completion aid?

Completion aids are a form of instruction but they are directed to the contents of a specific entry field control and the content, s format. a date, for example, may require entry of a specified number of characteristics in a specific order.

13) What is known as tabbling?

When a screen is first presented, the cursor must be positioned in the first field por control in which information can be entered. tabbling order must then follow the flow of information as it is organized on the screen.

14) What is meant by auto skipping?

Auto skip is a feature that causes a cursor to automatically move to the beginning of the next text entry control field once the previous field is completely filled. auto skip obviates manual tabbing and requires fewer key strokes to complete screen.

15) List the intranet design guidelines?

Provide a single home page containing at least, present a visual style, orient the intranet web sites towards tasks, includes many options and features, develop a strong navigational system.

16) List the extranet design guidelines?

To distinguish the extranetn from the intranet, provides a subtle difference in, provide links to the public internet site.

17) What are the guidelines to be followed to design a pie chart?

Pie charts should be used with caution,if pie charts are used,they must add up to 100 percent,use five segmente or fewer,each segment should take up at least 5 percent of the

circle, place the largest segment, directly label each segment in the normal normal reading orientation.

18) What are the advantages and disadvantages of cascading menu?

The advantages of the cascading menu,s are:

- the top level menu are simplified because some choices are hidden
- more first letter mnemonics are available because menus possess fewer alternatives.
- High level command browsing is easier because subtopics are hidden.

The disadvantages of cascading menus

- access to submenu items requires more steps.
- Access to submenu items require a change in pointer movement direction.

19) List the guidelines to be followed for tables?

Provide descriptive headings and where appropriate, subheadings for columns and rows, justify column heading according to the presented in the table cells, organize thje presented data or information logically and clearly. length should not be exceed the depth of the screen. use light backgrounds. provide consistent space between columns and rows.

20) Explain curve and line graphs?

Curves and line graphs can be used to show relationship between sets of data defined by two continous variables.

PART-B

1. Explain the importance of human considerations in user interface design with suitable example.

- The user's knowledge and experience
 - Computer literacy
 - System experience
 - Application experience
 - Task experience
 - Other system use
 - Education
 - Reading level
 - Typing skill
 - Native language or culture
- Job/task/need
 - Type of system use
 - Frequency of use
 - Task or need importance
 - Task structure
 - Social interactions

- Primary training
- Turnover rate
- Job category
- Lifestyle
- Psychological characteristics
 - Age
 - Gender
 - Handedness
 - Disabilities

2. What are the important human characteristics that influence the interface design process?

Discuss.

- Perception
 - Proximity
 - Similarity
 - Matching patterns
 - Succinctness
 - Closure
 - Unity
 - Continuity
 - Balance
 - Expectancies
 - Context
 - Signals versus noise
- Memory
- Sensory storage
- Visual acuity
- Foveal and peripheral vision
- Information processing
- Mental models
- Movement control
- Learning
- Skill
- Individual differences

3. What is requirement analysis? What are the methods involved in it? What is the impact of it on user interface design?

A requirement is an objective that must be met. A product description is developed and refined, based on input from users or marketing. There are many techniques for capturing information. The objective of it is to establish the need for a system.

Methods involved:

- Direct methods
 - Individual face to face interview
 - Telephone interview or survey
 - Traditional focus group
 - Facilitated team workshop
 - Observational field study
 - Requirements prototyping
 - User interface prototyping
 - Usability laboratory testing

- Card sorting for websites
- Indirect methods
 - MIS intermediary
 - Paper survey or questionnaire
 - Electronic survey or questionnaire
 - Electronic focus group
 - Marketing and sales
 - Support line
 - E-mail or bulletin board
 - User group
 - Competitor analysis
 - Trade show
 - Other media analysis
 - System testing

4. Discuss the process involved in understanding the user's mental model in detail.

A mental model is an internal representation of a person's current conceptualization and understanding of something. They are gradually developed in order to understand, explain, and do something and enable a person to predict the actions necessary to do things if they have been forgotten or yet to be encountered.

- Performing task analysis
 - Describes user activities precisely.
 - Breaks user activities to individual task level.
 - Provides information on workflows, relationship between people, objects, actions and the user's conceptual workflows.
 - Three techniques used to describe work activities: direct observation, interviews and questionnaires.
 - User's current tasks are listed as a result of task analysis.
 - Another result is a list of objects.
 - Concrete objects-things that can be touched
 - People who are the object of sentences-normally organization employees, customers, for example.
 - Forms or journals-things that keep track of information.
 - People who are the subject of sentences-normally the users of a system.
 - Abstract objects-anything not included above.

5. What are the guidelines to be followed while designing a conceptual model?

- Reflect the user's mental model and not the designer's.
- Draw physical analogies or present metaphors.
- Comply with expectancies, habits and stereotypes.
- Provide action response compatibility.
- Make invisible parts and process of a system visible.
- Provide proper and correct feedback.
 - Provide a continuous indication of status.
 - Provide visible result of actions.
 - Display actions in progress.
 - Present as much context information as possible.
 - Provide, clear, constructive and correct error messages.
- Avoid anything unnecessary or irrelevant.
- Provide design consistency.
- Provide documentation and a help system that will reinforce the conceptual model.

- Promote the development of both novice and expert mental models.

6. List the qualities that provide a visually pleasing composition for the screen design and discuss.

- Balance
 - By providing weight of screen elements left and right, top and bottom.
- Symmetry
 - By replicating elements left and right of the screen centerline.
- Regularity
 - By establishing standard and consistently spaced horizontal and vertical alignment points.
- Predictability
 - By being consistent and following conventional orders
- Sequentiality
 - By arranging elements to guide the eye through the screen in logical and efficient manner.
- Economy
 - By using as few styles, display techniques and colors as possible.
- Unity
 - By using similar sizes, shapes, colors for related information.
- Proportion
 - By creating windows and groupings of data with aesthetically pleasing proportion
- Simplicity
 - By optimizing the number of elements on screen.
- Groupings.
 - By providing meaningful titles for each group, space controls within a grouping and line borders around group.

7. Discuss the problems of poorly designed screens with examples.

As per Barnett (1993) the problems of poorly designed screen are:

- Unclear captions and badly worded questions cause hesitation and rereading to determine what is needed or provided.
- Improper type and graphic emphasis which draws away what is important and what not.
- Misleading headings creating confusion
- Irrelevant information request which questions the value of one what one is questioned, as is the value of the system.
- Information requests requiring backtracking and rethinking which results in inefficiency and increased mistakes.
- Cluttered, cramped layout creating bad initial impact leading to more errors.
- Poor quality of presentation, legibility, appearance, and arrangement which degrades performance slowing the user and causing more errors.

As per Howlett (1995) the problems of poorly designed screen are:

- Visual inconsistency in screen detail presentation.
- Lack of restraint in the use of design features.
- Overuse of three dimensional presentations.
- Overuse of too many bright colors.
- Poorly designed icons
- Bad typography.

- Metaphors those are either overbearing or too cute.
All these leads to screens that can be chaotic, confusing, disorganized, distracted or just plain ugly.

8. Draw a properly designed information entry/modification screen and explain the design guidelines that are followed in it?

ACCOUNT	
Number:	<input type="text"/> <input type="text"/> <input type="text"/>
Name:	<input type="text"/>
Street:	<input type="text"/>
City/State:	<input type="text"/> <input type="text"/>
Telephone:	<input type="text"/> <input type="text"/> <input type="text"/>

- Enhanced distinctiveness and readability for the data fields
- Compact and balanced look for the screen
- Recommended style for entry/modification field.

9. Explain the organization and structure guidelines for

- Display/read only screen**
- Dedicated source document**

a).Display/read only screen

- Organization
 - Logical and clear

- Limit to what is necessary
- Most frequently used information
 - On earliest screens
 - At the top of screens
- Captions
 - Meaningful
 - Consistently positioned in relation to data fields
 - Left or right aligned
- Text boxes
 - Do not include a surrounding border or box
- Spacing and grouping
 - Create logical groupings
 - Make them medium sized, about 5 or 7 lines
- Headings
 - Uppercase or headline style mixed case
 - Set off from related controls
- Data presentation
 - Visually emphasize the data
 - Give the data a meaningful structure
- Data arrangement
 - Align into columns
 - Organize for top to bottom scanning
- Data justification
 - Left justify for text
 - Right justify for numeric data
 - Create a data “ladder”
- Data display
 - Consider not displaying no, or null data
 - Consider data statements.

b). Dedicated source document

- Organization
 - Image of associated source document
- Captions
 - Abbreviations and contractions
 - Consistently positioned in relation to data fields
 - Right aligned
- Text boxes
 - Designate by boxes
- Spacing and grouping
 - Logical groupings found on source document
- Headings
 - Include if on source document
 - Upper case or headline style mixed case

- Set off from related controls
- Control arrangement
 - As arranged on source document
 - Left to right completion.
- Keying procedure
 - Use manual tabbing
- Required and optional input
 - Not necessary to differentiate
- Instructions and completion aids
 - None needed.

10. a) Explain the structure of menus?

b) Explain menu phrasing?

Structure of menus:

- Single menus
- Sequential linear menus
- Simultaneous menus
- Hierarchical menus
- Connected menus
- Event trapping menus

Phrasing the menu:

- Menu titles
- Menu choice description
- Menu instructions
- Intent indicators
- Keyboard equivalents
- Keyboard accelerators

11. a) Explain the function of menus?

b) Explain briefly about formatting of menus?

Functions of menus

- Navigation to new menu
- Execute an action or procedure
- Displaying information
- Data or parameter input

Formatting of menus

- Consistency
- Display
- Presentation
- Organization
- Complexity

- Item arrangement
- Ordering
- Groupings
- Line separators

12. What is statistical graphics? Explain the components of a statistical graphics?

A statistical graphic is data presented in a graphical format. A well designed statistical graphic, also referred to as a chart or graph, consists of complex ideas communicated with clarity, precision, and efficiency. It gives its viewer the greatest number of ideas, in the shortest time and in the smallest space and with least possible clutter.

Components:

- Data presentation
 - Emphasize the data
 - Redundant data
 - Data variation
 - Proper context
 - Restrict information carrying dimensions
 - Employ data in multiple ways
 - Maximize data density
 - Avoid unnecessary embellishment
 - Fill the display area
- Axes
- Scales and scaling
 - Tick marks
 - Linear scale
 - Scale markings
 - Start a numeric scale at zero
 - Minimization of scale digits
 - Single scale on each axis
 - Duplicate axes for large matrices
 - Scale interpretation
 - Consistency
 - Labeling
- Proportion
- Lines
- Labeling
 - Clear and detailed
 - Left to right
 - Integrate
 - One typeface
 - Separation
 - Source

- Legends
- Title
- Aiding interpretation of numbers

13. Explain the types of statistical graphics.

- Curve and line graphs
 - Single graph
 - Label identification
 - Legend
 - Tightly packed curves or lines
 - Important or critical data
 - Comparing actual and projected data
- Surface charts
 - Ordering
 - Coding schemes
 - Labels
- Scatter plots
 - Two dimensions
 - Consistent intervals
 - Distinguishable plots
 - Multiple data sets
- Bar graphs
 - Consistent orientation
 - Meaningful organization
 - Bar spacing
 - Differentiation
 - Important or critical data
 - Related bar ordering
 - Reference index
 - Labeling
 - Histograms or step charts
- Segmented or stacked bars
 - Data category ordering
 - Large segments
 - Coding scheme
 - Labeling
- Pie charts
 - Total 100 percent
 - Five segments or fewer
 - Minimum five percent
 - Start at 12:00
 - Labeling
 - Numbers with segment labels

- Segment coding
- Highlighting
- Tilting
- Flow charts
 - Order of steps
 - Orientation
 - Coding conventions
 - Arrows
 - Highlighting
 - Only one decision at each step
 - Consistently order and word all choices

14. Discuss briefly about navigating menus

- Website navigation problem
 - Technical issues
 - Usage problem
- Navigation goals
 - Control
 - Menu navigation aids
- Website navigation
 - Website organisation
- Components of a web navigation system
 - Browser command buttons
 - Website navigation bars
 - Other website navigation elements
- Website navigation guidelines
 - scrolling
 - number of links
 - presenting links
 - other link guidelines
 - kinds of links
 - link maintenance
- Maintaining a sense of place
 - Design characteristics that aid in maintaining a sense of place
 - Design elements that aid in maintaining a sense of place

15. Explain the kinds of graphical menu

- Menu bar
 - Display
 - Location
 - Title
 - Item description
 - Organization
 - Layout
 - Separation

- Pull down menu
 - Display
 - Location
 - Size
 - Title
 - Item description
 - Organization
 - Layout
 - Groupings
 - Mark toggles or settings
 - Pull down leading to another pull down
 - Pull downs leading to a window
- Keyboard equivalents and accelerators
 - Separation
 - Selection cursor
- Cascading menus
 - Cascade indicator
 - Location
 - Levels
 - Title
 - Other guidelines
- Pop up menus
 - Display
 - Location
 - Size
 - Title
- Tear off menus
 - Advantage: no space is consumed on the screen when the menu is not needed
 - Disadvantage: requires extrasteps to retrieve and it may obscure the screen working area
- Iconic menus
 - Advantage: facilitates memory of application and increases speed.
 - Disadvantage: requires special skills and an extended amount of time.
- Pie menus

UNIT-III

PART-A

1.What you mean by split box?

A window can be split into two or more panes by manipulating a split box located above a vertical scroll bar or to left of a horizontal scroll bar. A split box is also called as split bar. A window can be split into two or more separate viewing areas that are called panes. Splitting a window permits multiple views of an object.

2. Write a note on Size Grip?

A size grip is a Microsoft window special handle included in a window to permit it to be resized. When the grip is dragged the window resizes, following the same conventions as the sizing border.

3. What is known as Cascading Windows?

A special type of overlapping window has the windows automatically arranged in a regular progression. Each window is slightly offset from other.

4. What is known as Unfolding Windows?

An unfolding secondary window expands to reveal additional options, a form of progressive disclosure. Unfolding windows sometime called expanding windows, are generally used to provide advanced options at the same level in a complex dialog.

5. What is the use of Palette Window?

Palette widows are modeless secondary windows that present a set of controls. Palette windows are distinguished by their visual appearance, a collection of images, colors.

6. What is the use of Message Box?

A message box is a secondary window that displays a message about a particular situation or condition.

7. Give advantage of single document interface?

1. Most common usage.
2. Window manipulation is easier and less confusing.
3. Data centered approach.

8. Give the advantage of multiple document interface?

1. The child windows share the parent window's interface components.
2. Useful for managing a set of objects.
3. Provides a grouping and focus for a set of activities within the larger environment of the desktop.

9. What do you mean by Projects?

A project is similar to a multiple document interface, but does not visually contain the child windows. Objects represented by icons contained within it can be opened into primary windows that are peers with the parent window.

10. Why Window is organized?

Windows are organized to support user tasks. It also support the most common tasks in the most efficient sequence of steps.

11. What is the use of Primary Windows?

Primary window is used to begin an interaction and provide a top level context for dependent windows and to perform a major interaction.

12. What is a frame?

A frame is an independent pane of information presented in a Web page as multiple windows. Frames are presented as tiled, with no overlapping capability.

13. What are the tasks performed using graphical system?

- *To point at an object on the screen.
- *To select the object as the focus of attention.
- *To drag an object across the screen.
- *To orient an object
- *To enter data

14. What do you mean by Graphic Tablet?

A graphic tablet also called a touch tablet. It is a device with a horizontal surface sensitive to pressure, heat, light. It may lie on the desktop or keyboard. It may be operated with fingers, light pen, or objects like a pencil. The screen pointer imitates movement on the tablet.

15. What do you mean by Touch Screen?

A touch screen is a screen that consists of a special surface sensitive to finger or stylus touch. Objects on the screen are pointed to and touched to select them.

16. Give the mouse usage guidelines?

*Provide a “hot zone” around small objects that might require extremely fine mouse positioning.

*Never use double clicks as the only means of carrying out essential operations.

*Do not use mouse plus keystroke combinations.

*Do not require a person to point at a moving target.

17. What is the purpose of buttons?

*To start actions

*To change properties

*To display a popup menu

18. What are the advantages of voice?

*Simple and direct

*Useful for people who cannot use a keyboard

*Useful when the user's hands are occupied

19. What do you mean by combo box?

A combo box is a single rectangular text box entry field, beneath which is a larger rectangular list box displaying a list of options. The text box permits a choice to be keyed within it.

20. What do you mean by balloon tips?

A small popup window that contains information presented in a word balloon. Its components can include a title, body, text, message icons. Balloon tips appear adjacent to the item to which they apply.

PART-B

1. Explain how windows are useful? Explain its components?

- Presentation of Different Level of Information
- Presentation of Multiple Kinds of Information
- Sequential Presentation of Level or Kinds of Information
- Access to Different Sources of Information
- Combining Multiple Sources of Information
- Performing More Than One Task
- Reminding
- Monitoring
- Multiple Representations of the Same Task

Components of Window

- Frame
- Title Bar
- Title Bar Icon
- Window Sizing Buttons
- What's This ? Button
- Menu Bar
- Status Bar
- Scroll Bars
- Split Box
- Toolbar
- Command Area
- Size Grip
- Work Area

2.a) Explain briefly about the presentation style of window?

Window Presentation Styles

- Tiled Windows
- Overlapping Windows
- Cascading Windows

b) Explain about window management?

Window Management

- Single-Document Interface
- Multiple-Document Interface
- Workbooks
- Projects

3. Discuss briefly about the type of windows?

Types of Windows

- Primary Window
- Secondary Windows
 - Modal and Modeless
 - Cascading and Unfolding

- Dialog Boxes
- Property Sheet and Property Inspectors
- Message Boxes
- Palette Windows
- Pop-up Windows

4. Write a note on Organizing Window Functions?

Organizing Window Functions

Window Organization

- Organize window to support user tasks.
- Support the most common task in the most efficient sequence of steps.
- Use primary window to:
 - Begin an interaction and provide a top-level context for dependent windows
 - Perform a major interaction.
- Use Secondary windows to:
 - Extend the interaction.
 - Obtain or display supplemental information related to the primary window.
- Use dialog boxes for:
 - Infrequently used or needed information.
 - “Nice-to-know” information.

Number of Windows

- Minimize the number of windows needed to accomplish an objective.

5.a) Explain the type of Device Based Controls?

Type of Device Based Controls

- Trackball
- Joystick
- Graphic tablet
- Light pen
- Touch screen
- Voice
- Mouse
- Keyboard

b) Explain the Guidelines for Selecting the Proper Device-Based Control?

Guidelines for Selecting the Proper Device-Based Control

- Task characteristics

- User characteristics and preferences
- Environmental characteristics
- Hardware characteristics
- The device in relation to the application
- Flexibility
- Minimizing eye and hand movements

6. Explain the type of Operable Control?

Operable Controls

- Buttons
 - Command Buttons
 - Usage
 - Structure
 - Labels
 - Size
 - Number
 - Location and Layout
 - Organization
 - Intent Indicators
 - Expansion Buttons
 - Defaults
 - Unavailable Choices
 - Keyboard Equivalent and Accelerators
 - Scrolling
 - Button Activation
 - Toolbars
 - Usage
 - Structure
 - Labels
 - Size
 - Location
 - Organization
 - Active Items
 - Customization
 - Keyboard Equivalent and Accelerators
 - Button Activation

7. Explain the type of Presentation Control?

Type of Presentation Control

- Static Text Fields
 - Static Text Fields Guidelines
- Group Boxes
- Column Headings
- ToolTips
 - ToolTips Guidelines
- Balloon Tips
 - Balloon Tips Guidelines
- Progress Indicators
 - Progress Indicators Guidelines
- Sample Box
- Scrolling Tickers

8. Explain the type of Controls other than Operable Control?

- Text Entry/Read-Only Controls
 - Text Boxes
 - Single-Line and Multiple-Line Text Boxes
 - Captions
 - Fields
- Selection Controls
 - Radio Buttons
 - Choice Descriptions
 - size
 - Defaults
 - Structure
 - Organization
 - Related Control
 - Captions
 - Keyboard Equivalents
 - Selection Method and Indication
 - Check Boxes
 - Choice Descriptions
 - Size
 - Defaults
 - Structure
 - Organization
 - Related Control
 - Captions
 - Keyboard Equivalents

-Selection Method and Indication

- Palettes

-Graphical Representations

-Size

-Layout

-Organization

-Captions

-Selection Method and Indication

- List Boxes

- List Boxes General Guidelines

- ✓ Selection Descriptions
- ✓ List Size
- ✓ Box Size
- ✓ Organization
- ✓ Layout and Separation
- ✓ Captions
- ✓ Disabling
- ✓ Selection Method and Indication

-Single-Selection List Boxes

-Extended and Multiple-Selection List Boxes

- List View Controls
- Drop-down/Pop-up List Boxes

-Prompt Button

-Selection Descriptions

-List Size

-Box Size

-Organization

-Layout and Separation

-Captions

-Defaults

-Disabling

-Selection Method and Indication

- Combination Entry/Selection Controls

- Spin Boxes

-List Size

-List Organization

- Other Spin Box Guidelines
 - Combo Boxes
 - Prompt Button
 - Other Guidelines
- Type of Presentation Control
 - Static Text Fields
 - Static Text Fields Guidelines
 - Group Boxes
 - Column Headings
 - ToolTips
 - ToolTips Guidelines
 - Balloon Tips
 - Balloon Tips Guidelines
 - Progress Indicators
 - Progress Indicators Guidelines
 - Sample Box
 - Scrolling Tickers
- Selecting the Proper Controls
 - Entry versus Selection-A Comparison
 - Choosing a Type of Control
 - Aided versus Unaided Entry
 - Comparison of GUI Controls
 - Mutually Exclusive Choice Controls
 - Non exclusive Choice Controls
 - Combination for selecting a value within a range
 - Control Selection Criteria
 - Choosing a Control Form
 - When to Permit Text Entry
 - What KIND of Control to Choose

9. Explain guidelines for Selecting the Proper Controls?

Selecting the Proper Controls

- Entry versus Selection-A Comparison
 - Choosing a Type of Control
 - Aided versus Unaided Entry
- Comparison of GUI Controls
 - Mutually Exclusive Choice Controls
 - Non exclusive Choice Controls
 - Combination for selecting a value within a range
- Control Selection Criteria

- Choosing a Control Form
 - When to Permit Text Entry
 - What KIND of Control to Choose

UNIT IV

PART-A

1. What is meant by Response Time?

System responsiveness should match the speed and flow of human thought processes. If continuity of thinking is required and information must be remembered through out several responses, response time should be less than one or two seconds. Constant delays are preferable to variable delays.

2. What is known as Accessibility?

Accessibility, in general sense, means a system must be designed to be usable by an almost unlimited range of people, essentially anyone who desires to use it. In a narrower sense, accessibility can be defined as providing easy access to a system for people with disabilities.

3. What is known as cognitive disabilities?

It permit modification and simplification of the interface.

Limit the use of time-based interfaces.

Do not briefly display critical feedback or messages and then automatically remove them.

Provide an option to permit the user to adjust the length of the time-out

4. What is meant by Icons?

Icons are most often used to represent object and actions with which users can interact with or that they can manipulate. These types of icons may stand alone on the desktop or in a window, or grouped together in a toolbar.

5. Explain the purpose of hints.

To provide a few important contextual, but specific, items of information related too a displayed screen

6. What is meant by Dithering?

The eye is never steady, instead trembling slightly as we see. If pixels of different colors are placed next to each other, this tremor combines the two colors into a third color. This is referred to as dithering and sometimes texture mapping.

7. What is the use of video?

To show things that move or change over time

To show the proper way to perform a task

To provide a personal message

To grab attention

8. What is the use of multimedia?

Multimedia can hold the user's attention, and interest to a screen, entertain, and quickly convey information that is more difficult to present textually. It can make the web much more accessible to people with disabilities.

9. What are the classifications distinct purposes Graphics contained web pages?

- a) navigational
- b) representational
- c) Organizational
- d) Explanative
- e) Decorative

10. What are the guidelines of animation?

- Use only when an integral part of the content
- Create short segments
- Provide a freeze frame and stop mode
- Avoid distracting animation

11. How to create an image?

- Create familiar and concrete shapes
- Create visually and conceptually distinct shape
- Clearly reject objects represented
- Simply reflect objects represented, avoiding excessive detail
- Provide consistency in icon type

12. What are the technical qualities of an icon?

- Syntactic
- Semantics
- Pragmatics

13. What are the Seizure disorders?

- Use elements that do not blink or flicker at rates between frequency ranges of 2Hz and 55Hz
- Minimize the area of the screen that is flashing
- Avoid flashing that has a high level of contrast between states
- Provide an option to enable users to show down or disable screen flashing

14. What is meant by internationalization?

Internationalization is the process of isolating culturally specific elements from a product. It is used for creating the products.

15. What is meant by localization?

Localization is used when the market includes few or no English speakers, when translation is required by law or by custom and when the widest possible market is desired.

16. What are the physical movement disabilities?

- Provide voice-input system
- Provide a complete and simple keyboard interface
- Provide a simple mouse interface

- Provide on-screen keyboards
- Provide keyboard filters

17. What are the influences of the Icon usability?

- Familiar
- Clear and Legible
- Simple
- Consistent
- Direct
- Efficient
- Discriminable

18. What are the qualities of a successful icon?

- looks different from all other icons
- Is obvious what it does or represents
- Is recognizable when no larger than 16 pixels square
- Looks as good in black and white as in color

19. What is meant by static icons?

A static icon's appearance is unchanged over a period of time and changes only at the moment that a system event occurs. An example would be the open door of mailbox shutting when an electronic message is received.

20. What is meant by dynamic icons?

A dynamic icon's movement is independent of the system event, changing appearance to represent functions, processes, states and state transitions.

PART-B

1. Explain Kinds of Icons, Characteristics of icons and Choosing Icons?
2. Write a note on Writing Message Box Text?
3. Write a note on providing the proper feedback?

4. Discuss briefly about windows Guidelines and Web page Guidelines.

UNIT-V

PART-A

1.Kinds of Tests

A test is a tool that is used to measure something. The “something” may be

- ■ Conformance with a requirement.
- ■ Conformance with guidelines for good design.
- ■ Identification of design problems.
- ■ Ease of system learning.
- ■ Retention of learning over time.
- ■ Speed of task completion.

2. Visualization

Visualization is a cognitive process that enables people to understand information that is difficult to perceive, because it is either too voluminous or too abstract. It involves changing an entity’s representation to reveal gradually the structure and/or function of the underlying system or process.

3. Why the term hypermedia was coined to reflect the expanded nature?

Utilization of hypertext on the Web allowed links to be created using images as well as text, so the term hypermedia was coined to reflect this expanded nature.

4.WWW

World Wide Web is a global information space in which people can read and write using computers connected to the Internet. The term is often used as a synonym for the Internet.

5. How to Choosing a Testing Method?

Using cognitive walk-throughs early in the development process permits the identification and correction of the most serious problems. Later, when a functioning prototype is available, the remaining problems can be identified using a think-aloud evaluation.

6. Define Hypermedia.

The name hypertext or hypermedia has been applied to networks of nodes containing information that are connected by links. Hypermedia is used to convey the inclusion of other media, especially sound and video.

7. Difference between Heuristic Evaluation and Usability Testing

	HEURISTIC EVALUATION	USABILITY TEST
Addresses this question	Is the design optimized based upon what is known about how people interact with computers?	Can key users - Find the information? - Complete the transaction?
Recommendations derived from	- Current perception and cognition research. - Standards, guidelines, best practices, and experience.	- Direct observation of users doing tasks using system. - Analysis of gap between users' mental model and system conceptual model.
Complimentary benefits	Focuses on what the design brings to the user.	Focuses on what users bring to the design.
Benefits	- Rapid results. - Tactical recommendations. - Comprehensive evaluation.	- Synthesizes recommendations across the task experience. - Contextualizes recommendations to the specific objectives of the system and the limitations of the users.

8. Why is testing essential?

To wait until after a system has been implemented to uncover and correct any system usability deficiencies can be aggravating, costly, and time consuming for both users and developers. Indeed, after implementation many problems may never be corrected because of time constraints and costs. To minimize these kinds of problems and ensure usability, interfaces must be continually tested and refined before they are implemented.

9. Give some disadvantages of Usability test.

- High cost for establishing facility.
- Requires a test conductor with user interface expertise.
- Emphasis first-time system usage.
- Poorly suited for detecting inconsistency problems.

10. Prototype

A prototype is a simulation of an actual system that can be quickly created. A prototype may be a rough approximation, such as a simple hand-drawn sketch, or it may be interactive, allowing the user to key or select data using controls, navigate through menus, retrieve displays of data, and perform basic system functions. A prototype need not be perfectly realistic, but it must be reasonably accurate and legible.

11. Visualization data types

- 1-D linear data
- 12-D map data
- 3-D world
- Temporal data
- Multidimensional data
- Tree data
- Network data

12. Kinds of Prototypes used for User Interface Design.

- Hand Sketches and Scenarios
 - Screen Sketches created by hand
- Interactive Paper Prototypes
 - Interface components constructed of common paper technologies
- Programmed Facades
 - Examples of finished dialogs and screens for some important aspects of the system
- Prototype-Oriented Languages
 - An example of finished dialogs and screens for some important aspects of the system

13. Features of Web design

- Compactness and branching factors
- Sequencing, clustering and emphasis
- Support of universal access
- Good graphical design
- Navigation support
- The page length and number of links are the most important issues.

14. The Test Plan

- Define the scope of the test.
- Define the purpose of the test.
 - Performance goals.

- What the test is intended to accomplish.
- Create a test timetable.
- Define the test methodology.
 - Type of test to be performed.
 - Test limitations.
 - Developer participants.
- Develop scenarios to satisfy the test's purpose.
- Select test participants.
- Identify and schedule the test facility or location.
- Run a pilot test.

15. Guidelines for Classic Experiments

- State a clear and testable hypothesis.
- Specify a small number of independent variables to be manipulated.
- Carefully choose the measurements.
- Judiciously select study participants and carefully or randomly assign them to groups.
- Control for biasing factors.
- Collect the data in a controlled environment.
- Apply statistical methods to data analysis.
- Resolve the problem that led to conducting the experiment.

16. Think-Aloud Evaluations

In a think-aloud evaluation, users perform specific tasks while thinking aloud. The objective is to get the user to talk continuously. All comments are recorded so all thoughts are captured and subtle points are not missed when analysis occurs.

17. Heuristic Evaluation

In a heuristic evaluation, interface specialists study a system in depth and look for properties they know, from experience, will lead to problems. The interface is judged for its

compliance with recognized usability principles, the heuristics. These evaluations are also referred to as inspections and expert reviews.

18. Scope of Testing

Testing should begin in the earliest stages of product development. It is an iterative process performed throughout a product's design cycle. Paper or software prototypes are created and tested, and then design changes are made based on the test results. The redesigned product is then tested again, and the process repeated as necessary until all performance goals are met. At this point the iterative process ends. Testing should include as many of the user's tasks, and as many of the product's components, as reasonably possible.

19. Advantages of Programmed Facades

While much is missing underneath, what is visible can provide a good impression of finished design. Programmed facades also provide a good detailed specification for writing code, and can be vehicles for the actual collection of data.

21. Cognitive Walk-Throughs

In a cognitive walk-through, developers or users walk through an interface in the context of representative user tasks. Individual task actions are examined and the evaluators try to establish a logical reason why the user would perform each examined action.

PART-B

1. Write a note on Scope of Testing?

Hint: Prototypes, hand sketches and scenarios, interactive paper prototypes, Programmed facades, prototype oriented languages, comparisons of prototypes.

2. Explain the different kinds of test in detail?

Hint: guidelines review, heuristic evaluation, cognitive walkthroughs, think aloud evaluations, usability test, classic experiments, Focus groups, choosing a testing method.

3. What are the steps for developing and conducting test?

Hint: The test plan, Test participants, test conduct and data collection, usability test guidelines , analyze modify and retest, evaluate the working system.

4. Explain WWW with example?

5. Write a note on Information Search?

6. Discuss Briefly about Software tools.
