MODULE 1 QB

1) Define User Interface. Write in brief about the need for human computer interface / Write in brief the importance of Good Design.
Ans)
- User interface design is a subset of a field of study called human-computer interaction.
- Human-computer interaction is the study, planning and design of how people and computers work together so that a person's needs are satisfied in the most effective way.
- The user interface has two components: input and output.

Importance of Good Design:
- Inspite of today's rich technologies and tools we are unable to provide effective and usable screen because of lack of time and care.
- A well-designed interface and screen is terribly important to our users.
- It is their window to view the capabilities of the system.
- It is the vehicle through which complex tasks can be performed.
- A screen's layout and appearance affect a person in a variety of ways.
- If the screen layout is confusing and inefficient, people will have greater difficulty in doing their jobs and will make more mistakes.
- Poor design may even chase some people away from a system permanently.
- It can also lead to aggravation, frustration and increased stress.

2) Write the benefits of good design.

Ans)

Benefits of Good Design:
- The benefits of a well-designed screen have been under experimental study for many years.
- One researcher, for example, attempted to improve screen clarity and readability by making screens less crowded.
- The result: screen users of the modified screens completed transactions in 25% less time and with 25% fewer errors than those who used the original screens.
- Another researcher has reported that following good design principles reduced decision-making time by about 40%.
- Other benefits also come from good design (Karat, 1997).
- Training costs are lowered because training time is reduced.
- Support line costs are lowered because fewer assist calls are necessary.
- Employee satisfaction is increased because aggravation and frustration are reduced.
- Another benefit is the organization's customers benefit because of the improved service they receive.
- Identifying and resolving problems during the design and development process also has significant economic benefits.

3) Explain the advantages and disadvantages of GUI.
Ans)

Advantages:
1) Symbols recognized faster than text:
- Symbols can be recognized faster and more accurately than text.
- Icons speeds up the recognition.
- These icons allow speedy recognition of the type of message being presented.

2) Faster learning:
- A graphical, pictorial representation aids learning and symbols can also be easily learned.

3) Faster use and problem solving:
- Visual or spatial representation of information has been found to be easier to retain and manipulate.
- It leads to faster and more successful problem solving.

4) Easier remembering:
- Because of greater simplicity, it is easier for casual users to retain operational concepts.

5) More natural:
- Symbolic displays are more natural and advantageous because the human mind has a powerful image memory.

6) Fewer errors:
- Reversibility of actions reduces error rates because it is always possible to undo the last step.
- Error messages are less frequently needed.

7) Increased feeling of control:
- The user initiates actions and feels in control.
- This increases user confidence.

8) Immediate feedback:
- The results of actions furthering user goals can be seen immediately.
- If the response is not in the desired direction, the direction can be changed quickly.

9) Predictable system responses:
- Predictable system responses also speed learning.

10) Easily reversible actions:
- This ability to reverse unwanted actions also increases user confidence.

11) More attractive:
- Direct-manipulation systems are more entertaining, cleverer and more appealing.

12) May consume less space:
- Icons may take up less space than the equivalent in words but this is not the case always.

13) Replaces national languages:
- Icons possess much more universality than text and are much more easily comprehended worldwide.

14) Easily augmented with text displays:
- Where graphical design limitations exist, direct-manipulation systems can easily be augmented with text displays.
- The reverse is not true.

15) Low typing requirements:
- Pointing and selection controls, such as the mouse or trackball, eliminate the need for typing skills.

Disadvantages:

1) Greater design complexity:
- Controls and basic alternatives must be chosen from a pile of choices numbering in excess of 50.
- This design potential may not necessarily result in better design unless proper controls and windows are selected.
- Poor design can undermine acceptance.

2) Learning still necessary:
- The first time one encounters many graphical systems, what to do is not immediately obvious.
- A severe learning and remembering requirement is imposed on many users because meanings of icons or using pointing device have to be learned.

3) Lack of experimentally-derived design guidelines:
- Today there is a lack of widely available experimentally-derived design guidelines.
- Earlier only few studies to aid in making design decisions were performed and available for today now.
- Consequently, there is too little understanding of how most design aspects relate to productivity and satisfaction.

4) Inconsistencies in technique and terminology:
- Many differences in technique, terminology, and look and feel exist among various graphical system providers and even among successive versions of the same system.
- So the user has to learn or relearn again while shifting to next terminology.

5) Not always familiar:
- Symbolic representations may not be as familiar as words or numbers.
- Numeric symbols elicit faster responses than graphic symbols in a visual search task.

6) Window manipulation requirements:
- Window handling and manipulation times are still excessive and repetitive.
- This wastes time.

7) Production limitations:
- The number of symbols that can be clearly produced using today's technology is still limited.
- A body of recognizable symbols must be produced that are equally legible and equally recognizable using differing technologies.
- This is extremely difficult today.

8) Few tested icons exist:
- Icons must be researched, designed, tested, and then introduced into the marketplace.
- The consequences of poor or improper design will be confusion and lower productivity for users.

9) Inefficient for touch typists:
- For an experienced touch typist, the keyboard is a very fast and powerful device.

10) Not always the preferred style of interaction:
- Not all users prefer a pure iconic interface.
- User will also prefer alternatives with textual captions.

11) Not always fastest style of interaction:
- Graphic instructions on an automated bank teller machine were inferior to textual instructions.

12) May consume more screen space:
- Not all applications will consume less screen space.
- A listing of names and telephone numbers in a textual format will be more efficient to scan than a card file.

13) Hardware limitations:
- Good design also requires hardware of adequate power, processing speed, screen resolution and graphic capability.

(Learn atleast 10-12 advantages and disadvantages)

4) Elaborate the general principles of User Interface Design.
OR
Explain the characteristics and principles of UID.
Ans)

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

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.

7. Directness:

Provide direct ways to accomplish tasks.

- Available alternatives should be visible.
- The effect of actions on objects should be visible.

8. Efficiency:

- Minimize eye and hand movements, and other control actions.
    - Transitions between various system controls should flow easily and freely.
    - Navigation paths should be as short as possible.
    - Eye movement through a screen should be obvious and sequential.
- Anticipate the user's wants and needs whenever possible.

9. Familiarity:

- Employ familiar concepts and use a language that is familiar to the user.
- Keep the interface natural, mimicking the user's behavior patterns.
- Use real-world metaphors.

10. Flexibility:

A system must be sensitive to the differing needs of its users, enabling a level and type of performance based upon:

- Each user's knowledge and skills.
- Each user's experience.
- Each user's personal preference.
- Each user's habits.
- The conditions at that moment.

11. Forgiveness:

- Tolerate and forgive common and unavoidable human errors.
- Prevent errors from occurring whenever possible.
- Protect against possible catastrophic errors.
- When an error does occur, provide constructive messages.

12. Predictability:

- The user should be able to anticipate the natural progression of each task.
    - Provide distinct and recognizable screen elements.
    - Provide cues to the result of an action to be performed.
- All expectations should be fulfilled uniformly and completely.

13. Recovery:

- A system should permit:
- Commands or actions to be abolished or reversed.

- Immediate return to a certain point if difficulties arise.
- Ensure that users never lose their work as a result of:
  - An error on their part.
  - Hardware, software, or communication problems.

14. Responsiveness:
- The system must rapidly respond to the user's requests.
- Provide immediate acknowledgment for all user actions:
  - Visual.
  - Textual.
  - Auditory.

15. Simplicity:

- Provide as simple an interface as possible.
- Five ways to provide simplicity:
  - Use progressive disclosure, hiding things until they are needed.
- Present common and necessary functions first.
- Prominently feature important functions.
- Hide more sophisticated and less frequently used functions.
  - Provide defaults.
  - Minimize screen alignment points.
  - Make common actions simple at the expense of uncommon actions being made harder.
  - Provide uniformity and consistency.

16. Transparency:
Permit the user to focus on the task or job, without concern for the mechanics of the interface.
- Workings and reminders of workings inside the computer should be invisible to the user.

17. Trade-Offs:
- Final design will be based on a series of trade-offs balancing often-conflicting design principles.
- People's requirements always take precedence over technical requirements.

(Learn atleast 12 to 15 points)

5) Explain the characteristics of graphical user interface.

Ans)

1) Sophisticated Visual Presentation:
- It is the visual aspect of the interface and what people see on the screen.
- It permits displaying lines, including drawings and icons.
- It also permits the displaying of a variety of character fonts, including different sizes and styles.
- The objective is to reflect visually on the screen the real world of the user as realistic, meaningful, simple and as clear as possible.

2) Pick-and-Click Interaction:
- Elements of a graphical screen upon which some action is to be performed must first be identified.
- The primary mechanism for performing this pick-and-click is most often the mouse and its buttons.
- The secondary mechanism for performing these selection actions is the keyboard.

3) Restricted Set of Interface Options:

- 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, nothing more.
- This concept fostered the acronym WYSIWYG.

4) Visualization:

- It is a cognitive process that allows people to understand information that is difficult to perceive, because it is either too voluminous or too abstract.
- Presenting specialized graphic portrayals facilitates visualization.
- The best visualization method for an activity depends on what people are trying to learn from the data.

5) Object Orientation:

- A graphical system consists of objects and actions.
- 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.

6) Use of Recognition Memory:

- Continuous visibility of objects and actions encourages to eliminate - out of sight, out of mind problem.

7) Concurrent Performance of Functions:

- Graphic systems may do two or more things at one time.
- Multiple programs may run simultaneously.
- It may process background tasks.
- Data may also be transferred between programs.
- Data may be temporarily stored on a clipboard.

6) Differentiate between GUI and Web Interface.

Ans)

GUI	Web Interface
1) Screen appears exactly as specified.	1) Screen appearance influenced by hardware being used.
2) User focuses on Data and Applications.	2) User focuses on Information and Navigation.
3) Typically created and used by known and trusted sources	3) Full of unknown content. Source not always trusted
4) Controlled and constrained by program.	4) Infinite and generally unorganized.
5) Contains - Windows, menus, controls, data, toolbars, messages, and so on.	5) Contains two components - browser and page.
6) Navigation through menus, lists, trees, dialogs, and wizards.	6) Navigation through links, bookmarks, and typed URLs.
7) User tasks - Install, configure, personalize, start, open, use and close data files.	7) User tasks - Link to a site, browse or read pages, fill out forms, upgrade programs.
8) Response Time is nearly instantaneous.	8) Response Time is quite variable, depends on few factors.
9) Targeted to a specific audience with specific tasks.	9) Often intended for anyone and everyone.
10) Little significant personalization.	10) Limited personalization available.

11) Typically placed into system by users or known people and organizations.	11) Often not placed onto the Web by users or known people and organizations.
12) Presented as specified by designer.	12) May not be presented as specified by designer.
13) Typically prescribed and constrained by toolkit.	13) Encourages a more artistic, individual and unrestricted presentation style.
14) Personal support desk is usually provided.	14) Customer service support is usually provided.

7) Define GUI. Give example.

Ans) GUI means the user can interact with the visual representations on digital control panels.
Ex: Tablets, smartphones, gaming systems.

8) Discuss the direct & indirect manipulation graphical system with examples.
Ans)

Direct Manipulation:

They possess the following characteristics:

The system is portrayed as an extension of the real world:
- A person is allowed to work in a familiar environment and in a familiar way, focusing on the data, not the application and tools.
- The physical organization of the system, which most often is unfamiliar, is hidden from view and is not a distraction.

Continuous visibility of objects and actions:
- Objects are continuously visible.
- There are reminders of actions to be performed.

Actions are rapid and incremental with visible display of results:
- The results of actions are immediately displayed visually on the screen in their new and current form.
- Auditory feedback may also be provided.
- The impact of a previous action is quickly seen, and the evolution of tasks is continuous and effortless.

Incremental actions are easily reversible:
- Finally, actions, if discovered to be incorrect or not desired, can be easily undone.

Indirect Manipulation:
- In practice, direct manipulation of all screen objects and actions may not be feasible because of the following:
  - The operation may be difficult to conceptualize in the graphical system.
  - The graphics capability of the system may be limited.
  - The amount of space available for placing manipulation controls in the window border may be limited.
  - It may be difficult for people to learn and remember all the necessary operations and actions.
- When this occurs, indirect manipulation is provided.
- Indirect manipulation substitutes words and text, such as pull-down or pop-up menus, for symbols and substitutes typing for pointing.

9) Explain Application versus Object/Data Orientation.
Ans)

An application-oriented action: object approach does this:
Action> 1. An application is opened (for example, word processing).
Object> 2. A file or other object selected (for example, a memo).

An object-oriented object: action approach does this:
Object> 1. An object is chosen (a memo).
Action> 2. An application is selected (word processing).

10) Differentiate between Internet and Intranet.
Ans)

Internet	Intranet
1) Connects different networks of computers simultaneously.	1) It is owned by private firms.
2) There are multiple users.	2) There are limited users.
3) It is unsafe.	3) It is safe.
4) There are more number of visitors.	4) There are less number of visitors.
5) It is public network.	5) It is private network.
6) Anyone can access it.	6) Anyone cannot access it.
7) Provides unlimited information.	7) Provides limited information.
8) It includes several intranets.	8) It is like a subset of internet.