U20CS851 (R2020)
HUMAN COMPUTER INTERACTION

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UNIT I FOUNDATIONS OF HCI

The Human: I/O channels – Memory – Reasoning and problem solving; The Computer: Devices – Memory – processing and networks; Interaction: Models – frameworks – Ergonomics – styles – elements – interactivity- Paradigms. - Case Studies

UNIT II DESIGN & SOFTWARE PROCESS

Interactive Design: Basics – process – scenarios – navigation – screen design – Iteration and prototyping. HCI in software process: Software life cycle – usability engineering – Prototyping in practice – design rationale. Design rules: principles, standards, guidelines, rules. Evaluation Techniques – Universal Design

UNIT III MODELS AND THEORIES

HCI Models: Cognitive models: Socio-Organizational issues and stakeholder requirements –Communication and collaboration models-Hypertext, Multimedia and WWW.

UNIT IV MOBILE HCI

Mobile Ecosystem: Platforms, Application frameworks- Types of Mobile Applications: Widgets, Applications, Games- Mobile Information Architecture, Mobile 2.0, Mobile Design: Elements of Mobile Design, Tools. - Case Studies **UNIT V WEB INTERFACE DESIGN**

Designing Web Interfaces – Drag & Drop, Direct Selection, Contextual Tools, Overlays, Inlays and Virtual Pages, Process Flow - Case Studies

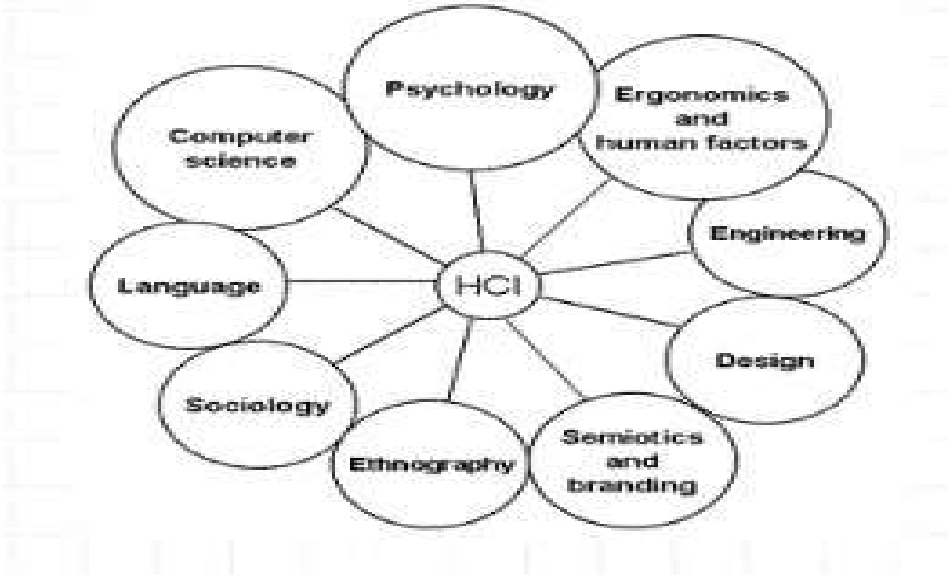
Unit –I - FOUNDATIONS OF HCI
PART - A

1. What is HCI ?(Understanding)

HCI (human-computer interaction) is the study of how people interact with computers and to what extent computers are or are not developed for successful interaction with human beings.

Human–computer interaction researches the design and use of computer technology, focused on the interfaces between people (users) and computers. Researchers in the field of HCI both observe the ways in which humans interact with computers and design technologies that let humans interact with computers in novel ways.

2. List the fields involved in HCI ? (Understanding)



3. List the various human input and output channels ? (Understanding)

- Visual channel
- Auditory channel
- Haptic channel
- Movement

4. Write the 2 stages of vision and give the human hearing frequency range(Understanding)

1. Physical reception of stimulus
2. Processing and interpretation of stimulus

Humans can hear frequencies from 20Hz to 15kHz

5. **Define Fitts' Law (Remember)**

Fitts' Law describes the time taken to hit a screen target:

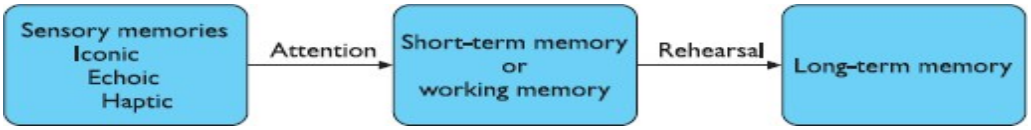
$$Mt = a + b \log_2(D/S + 1)$$

where: a and b are empirically determined constants

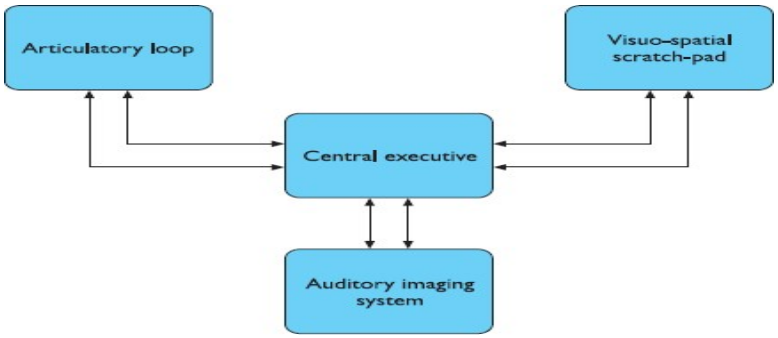
Mt is movement time, D is Distance , S is Size of target

6. **What are the different types of memory in human brain? (Understanding)**
   - Sensory memory
   - Short-term (working) memory
   - Long-term memory.

7. **Give the model of the structure of the memory(Understanding)**



8. **Give the model of short-term memory(Understanding)**



9. **List the factors involved in processing and applying the Information ? (Understanding)**
   - reasoning
   - problem solving
   - skill acquisition
   - Error

10. **What is reasoning and give its type ? (Apr/May '17) (Understanding)**

Reasoning is the process by which we use the knowledge we have to draw conclusions or infer something new about the domain of interest. There are a number of different .types of reasoning:

a. deductive
b. inductive
c. abductive.

11. Give example for deductive, inductive ,abductive – reasoning (Analyze)

a. Deductive - derive logically necessary conclusion from given premises.

e.g. If it is Friday then she will go to work
It is Friday
Therefore she will go to work

b. Inductive - generalize from cases seen to cases unseen

e.g. All elephants we have seen have trunks
therefore all elephants have trunks.

c. Abductive. – reasoning from event to cause

ex: Sam drives fast when drunk
if I see sam driving fast , assuming drunk

12. Define Problem Solving & list the theories involved in problem solving (Understanding)

Problem solving is the process of finding a solution to an unfamiliar task, using the knowledge we have. Human problem solving is characterized by the ability to adapt the information we have to deal with new situations.

Theories involved in problem solving

1. Gestalt theory
2. Problem space theory
3. Analogy – mapping knowledge relating to a similar known domain to the new problem – called analogical mapping.

13. What are the different types of errors(Understanding)

Types of error

- Slips
  - right intention, but failed to do it right
  - causes: poor physical skill,inattention etc.
  - change to aspect of skilled behaviour can cause slip
- Mistakes
  - wrong intention
  - cause: incorrect understanding

Humans create mental models to explain behaviour. If wrong (different from actual system) errors can occur.

14. What are three basic levels of skill ? (Understanding)

1. The learner uses general-purpose rules which interpret facts about a problem. This is slow and demanding on memory access.
2. The learner develops rules specific to the task.

3. The rules are tuned to speed up performance.

15. What is mental model? (Understanding)

People build their own theories to understand the causal behavior of systems. These have been termed mental models.

16. Give the uses of input device(Understanding)

Input devices for interactive use, allowing text entry, drawing and selection from the screen:

- Text entry: traditional keyboard, phone text entry, speech and handwriting
- Pointing: principally the mouse, but also touchpad, stylus and others
- 3D interaction devices.

17. What are the various devices in the physical world ? (Understanding)

Various devices in the physical world:

- Physical controls and dedicated displays
- Sound, smell and haptic feedback
- Sensors for nearly everything including movement, temperature, bio-signs.

18. Give the capacities of different storage media (Understanding)

	STM small/fast	LTM large/slower
Media	RAM	Hard disk
Capacity	256 Mbytes	100 Gbytes
Access time	10 ns	7 ms
Transfer rate	100 Mbyte/s	30 Mbyte/s

19. Define Compression and its types (Understanding)

Reduce amount of storage required

- Lossless
  - recover exact text or image – e.g. GIF, ZIP
  - look for commonalities:
    - text: AAAAAAAAAABBBBBCCCCCCCC →10A5B8C
    - video: compare successive frames and store change
- Lossy
  - recover something like original – e.g. JPEG, MP3
  - exploit perception
    - JPEG: lose rapid changes and some colour

- MP3: reduce accuracy of drowned out notes

20. What are the 2 methods for detecting motion ? (Understanding)

- Mechanical
  - Ball on underside of mouse turns as mouse is moved
  - Rotates orthogonal potentiometers
  - Can be used on almost any flat surface
- Optical
  - light emitting diode on underside of mouse
  - may use special grid-like pad or just on desk
  - less susceptible to dust and dirt
  - detects fluctuating alterations in reflected light intensity to calculate relative motion in (x, z) plane

21. List the computer types in pockets and house ? (Understanding)

In house	In pockets
• PC • TV, VCR, DVD, HiFi, cable/satellite TV • microwave, cooker, washing machine • central heating • security system	• PDA • phone, camera • smart card, card with magnetic strip • electronic car key • USB memory

22. Limitations on interactive performance(Understanding)

Computation bound
- Computation takes ages, causing frustration for the user

Storage channel bound
- Bottleneck in transference of data from disk to memory

Graphics bound
- Common bottleneck: updating displays requires a lot of effort - sometimes helped by adding a graphics co-processor optimised to take on the burden

Network capacity
- Many computers networked - shared resources and files, access to printers etc. - but interactive performance can be reduced by slow network speed

23. Define the term of interaction i.e. domain , goal , task(Understanding)

Domain – the area of work under study
e.g. graphic design

Goal – what you want to achieve

e.g. create a solid red triangle

Task – how you go about doing it

– ultimately in terms of operations or actions

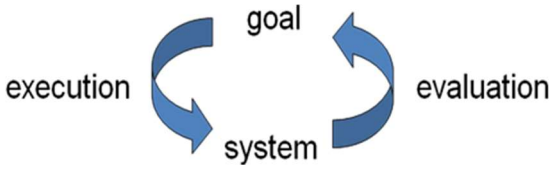
e.g. … select fill tool, click over triangle

24. List the seven stages of Donald Norman's model (Understanding)

The seven stages are

- User establishes the goal
- Formulates intention
- Specifies actions at interface
- Executes action
- Perceives system state
- Interprets system state
- Evaluates system state with respect to goal

25. List the steps involved execution/evaluation loop(Understanding)



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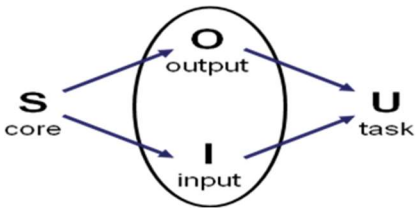
26. What are the 4 parts of Abowd and Beale framework(Understanding)

It is the extension of Norman model, it has 4 parts

a. user
b. input
c. system
d. output



27. Define Ergonomics with example (Apr/May '17) (Understanding)

- Study of the physical characteristics of interaction
- Ergonomics good at defining standards and guidelines for constraining the way we design certain aspects of systems

Ex 1: arrangement of controls and displays
e.g. controls grouped according to function or frequency of use, or sequentially
Ex 2: surrounding environment
e.g. seating arrangements adaptable to cope with all sizes of user

28. What are the Common interaction styles (Understanding)

- Command line interface
- Menus
- Natural language
- Question/answer and query dialogue
- Form-fills and spreadsheets
- WIMP
- Point and click
- Three–dimensional interfaces

29. What is WIMP Interface(Understanding)

Windows , Icons , Menus , Pointers. It is the default style for majority of interactive computer systems, especially PCs and desktop machines

30. What are Paradigms? (Understanding)

Predominant theoretical frameworks or scientific world views
e.g., Aristotelian, Newtonian, Einsteinian (relativistic) paradigms in physics

31. Give example for Paradigm Shifts(Remember)

- Batch processing
- Timesharing
- Networking
- Graphical display
- Microprocessor
- WWW
- Ubiquitous Computing

32. What is Metaphor(Understanding)

Relating computing to other real-world activity is called metaphor. Example:

1. LOGO's turtle dragging its tail
2. File management on an office desktop
3. Word processing as typing
4. Financial analysis on spreadsheets
5. Virtual reality – user inside the metaphor

33. What is CSCW ? (Understanding)

- Computer Supported Cooperative Work
- CSCW removes bias of single user / single computer system
- Can no longer neglect the social aspects
- Electronic mail is most prominent success

34. How does spreading activation affect the interference effects during information recall from memory? (Nov/Dec '17) (Understanding)

When information becomes easier to access as a result of having been used recently, we say it is more activated. This activation spreads between semantically related concepts.

Empirical Evidence:

- Subjects are faster at confirming that a pair of words are both words if the second word is an associate of the first, for example, bread and butter.
- Given a word, subjects are asked to give an associated word. Their response is faster if subjects have responded with an associated word on a previous trial.
- Speed of activation seems to be about 200ms

35. What type of HCI paradigm could be used to monitor eruptions of active and hazardous volcanoes? Reason out? (Nov/Dec '17) (Understanding)

The type of HCI paradigm used to monitor eruptions of active and hazardous volcanoes is Ubiquitous, or pervasive computing. It is a emerging paradigm for computing. The aim of pervasive computing is to create a computing infrastructure that permeates our physical environment such that we no longer notice the computer

36. What are mental models and why are they important in interface design? (Remember)(April/May 2018)

They are the beliefs that a user holds about any given system or interaction. This is important because users will plan and predict future actions within a system based on their mental models. Designers can tap into users mental models so that their products communicate their function through their form.

37. List out the text entry devices.(**Remember)(April/May 2018)**

- Keyboard.
- Image scanner.
- Microphone.
- Pointing **device**. Graphics tablet. Joystick. Light pen. Mouse. Optical. Pointing stick. Touchpad. Touchscreen. Trackball.
- Refreshable braille display.
- Sound card.

- Webcam. Softcam.
- Video card.

38. What is Directive reasoning? (Remember) (NOV/DEC 2018)

Directive reasoning is sometimes referred to as top down logic. Its counterpart, inductive reasoning, is sometimes referred to as bottom-up logic.

39. List the factors that can limit the speed of an interactive system? (Remember) (NOV/DEC 2018) /
What are the important factors to be considered in design of an interactive systems? (Remember) (Apr/May 2019)

Several factors that can limit the speed of an interactive system. They can be:

- Computation bound: Make sure the user has an indication of the system's progress.
- Storage channel bound: Select the best fitting kind of memory and access technique.
- Graphics bound: The actual time of graphic operations can differ much from the estimates.
- Network capacity

40. Give an example for recency effect. (Remember) (Apr/May 2019)

The recency effect is the tendency to remember the most recently presented information best. For example, if you are trying to memorize a list of items, the recency effect means you are more likely to recall the items from the list that you studied last.

PART – B

1. Describe about I/O channels & Human Memory(Understanding)
2. Explain about reasoning and problem solving(Understanding)
3. Explain about devices for virtual reality and 3D interaction(Understanding)
4. Explain in detail about models of interaction(Understanding)
5. Explain the various interaction styles(Analyze)
6. Explain the Paradigms for Interaction(Understanding)
7. Distinguish between short term and long term memory. State requirements to perform cognitive walkthrough of a system. **(Nov/Dec '17)(**Analyze)
8. With examples explain the various types of users and the organizational issues to be considered in designing an interactive system. **(Nov/Dec '17)** (Understanding)
9. (i) Explain the model of the structure of human memory with diagrammatic illustration. **(Apr/May '17)** (Understanding)
   (ii)Outline the factors that can limit the speed of an interactive computer system. **(Apr/May '17)** (Understanding)
10. i)List and explain the stages of Norman's model of interaction.
    (Apr/May '17) (Understanding)

(ii) Outline the common interface styles used in interactive system. **(Apr/May '17)** (Understanding)

11. Explain the framework of Human computer interaction (Remember) **(NOV/DEC 2018)**
12. Highlight the features of direct manipulation interface (Remember) **(NOV/DEC 2018)**
13. Discuss the technologies involved in display devices? (Remember) **(NOV/DEC 2018)**
14. Brief about the common interface styles used in interactive system (Remember) **NOV/DEC 2018**
15. i) Discuss in detail about the interaction frameworks (Remember)
    ii) Brief about the memory devices of a computer (Remember) **(Apr/May 2019)**
16. i) Explain the different types of reasoning (Remember) **(Apr/May 2019)**
    ii) Describe the various styles of interaction (Remember) **(Apr/May 2019)**
17. Explain about the elements of the WIMP interface.(Understand) **(Apr/May '18)**
18. Write down the effects of finite processor. (Understand)**(Apr/May '18)**
    ii)Write down the factors that can limit the speed of an interactive system
19. Design a word processor for blind users which can also be operated by sighted people. It has to support the standard set of word processing task. For this application, choose a suitable combination of input and output devices to best support the intended interaction. It may help to identify typical users or classes of user, and identify how the devices chosen support these people in their tasks. Explain the major problems that the input and output devices solve. (Analyse) **(Apr/May '19)**

UNIT II - DESIGN & SOFTWARE PROCESS
PART – A

1. Define Interaction Design(Understanding)

Interaction design is about understanding and choosing how that is going to affect the way people work.

2. What is the golden rule of design? (Understanding)

The golden rule of design is to "**understand your materials**". In case of Human–Computer Interaction the obvious materials are the human and the computer. In other words, it is

- **understand computers** – limitations, capacities, tools, platforms
- **understand people** – psychological, social aspects, human error.

3. Define Scenarios(Understanding)

Scenarios are the simplest design representation, but one of the most flexible and powerful. Some scenarios are quite short and others are focused more on

describing the situation or **context**.

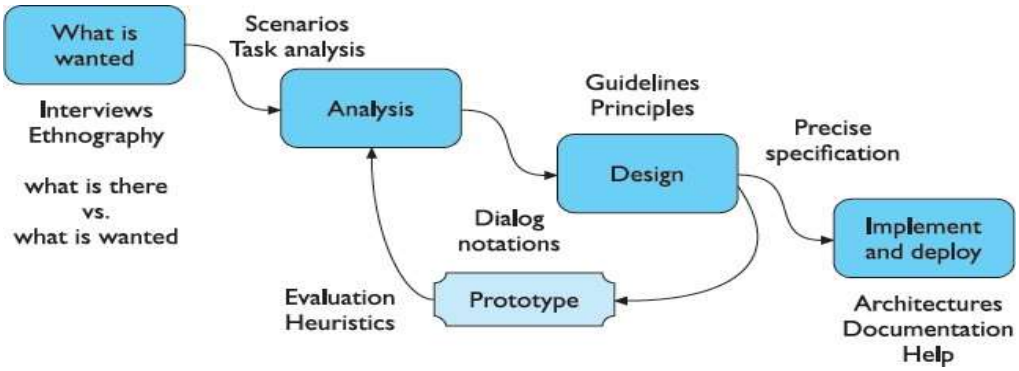
4. What are Story boards? (Understanding)

Scenarios can be augmented by sketches, simulated screen shots, etc. These sketches and pictures are called storyboards and are similar to the techniques used in film making to visualize plot-lines.

5. Explain the Process of Design(Remember)

The Various stages of the design process are

1. Requirements
2. Analysis
3. Design
4. Iteration and prototyping
5. Implementation and deployment



6. List the situations where scenarios can be used? (Understanding)

Scenarios can be used to:

Communicate with others – other designers, clients or users.

Validate other models A detailed scenario can be 'played' against various more formal representations such as task models or dialog and navigation models.

Express dynamics Individual screen shots and pictures give you a sense of what a system would look like, but not how it behaves.

7. Discuss about the pros and cons of Linear Path Scenario(Understanding)

Pros:

- Life and time are linear
- Easy to understand (stories and narrative are natural)
- Concrete (errors less likely)

Cons:

- No choice, no branches, no special conditions
- Miss the unintended

8. What are the two issues in structure with respect to Navigation design? (Understanding)

The two issues in structure are:

- Local structure : looking from one screen or page out
- Global structure : structure of site, movement between screens

9. **List out the various levels of interaction in Navigation design? (Understanding)**

PC application	Website	Physical device
Widgets Screen design Navigation design Other apps and operating system	Form elements, tags and links Page design Site structure The web, browser, external links	Buttons, dials, lights, displays Physical layout Main modes of device The real world

10. **What are bread crumbs? (Understanding)**

A "**breadcrumb**" (or "**breadcrumb** trail") is a type of secondary **navigation** scheme that reveals the user's location in a **website** or **Web** application.

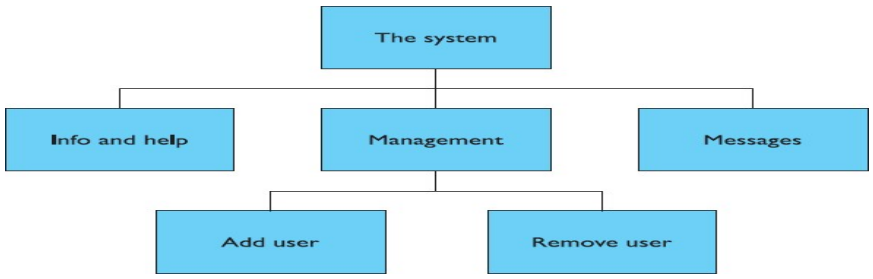
11. **What are the different types of bread crumbs ?(Analyze)**

Location-based : Location-based breadcrumbs show the user where they are in the website's hierarchy.

Attribute-based : Attribute-based breadcrumb display the attributes of a particular page.

Path-based : Path-based breadcrumb show users the steps they've taken to arrive at a particular page. Path-based breadcrumbs are dynamic in that they display the pages the user has visited before arriving on the current page.

12. **Draw the menu structure of a PC application. (Create)**



13. **List out the tools for screen layout? (Understanding)**

There are number of visual tools available to help the user appropriate ways to read and interact with a screen or device

- Grouping and structure
- Order of groups and items
- Decoration
- Alignment
- White space

14. **What is formative evaluation? (Understanding)**

***Formative* evaluation** for any of the prototypes, either paper-based or running software, which is evaluated to check whether they are acceptable or there is room for improvement. This sort of evaluation is intended to improve designs.

15. What is summative evaluation? (Understanding)

Summative evaluation is performed at the end to verify whether the product is good enough.

16. How software engineering plays a role in interactive system design? (Understanding)

Software engineering provides a means of understanding the structure of the design process, and that process can be assessed for its effectiveness in interactive system design

17. Define software life cycle? (Understanding)

Software life cycle, which describes the activities that take place from the initial concept formation for a software system up until its eventual phasing out and replacement

18. What are the activities in the software life cycle? (Understanding)

The activities in the software life cycle are

1. Requirements specification
2. Architectural design
3. Detailed design
4. Verification & Validation
5. Management and contractual issues

19. List some of the specifications in Usability engineering(Understanding)

Some of the usability specifications are

- usability attribute/principle
- measuring concept
- measuring method
- now level/ worst case/ planned level/ best case

20. What are the problems in Usability engineering? (Understanding)

The problems in Usability engineering

- usability specification requires level of detail that may not be
- possible early in design satisfying a usability specification
- does not necessarily satisfy usability

21. What are the three main approaches to prototyping? (Understanding)

The three main approaches to prototyping are

- **Throw-away:** The prototype is built and tested.
- **Incremental:** The final product is built as separate components.
- **Evolutionary:** It serves as the basis for the next iteration of design.

22. Define design rationale and its benefits? (Understanding)

Design rationale is information that explains why a computer system is the way it is, including its structural or architectural description and its functional or behavioral description.

Benefits of design rationale

- communication throughout life cycle
- reuse of design knowledge across products
- enforces design discipline
- presents arguments for design trade-offs
- organizes potentially large design space

- capturing contextual information

23. List some of the goals of Evaluation? (Understanding)

The goals of Evaluation are

- Assess extent of system functionality
- Assess effect of interface on user
- Identify specific problems

24. What are the four approaches to expert analysis(Understanding)

The four approaches to expert analysis are cognitive walkthrough, heuristic evaluation, the use of models and use of previous work.

25. What is Cognitive walkthrough (Understanding)

Cognitive walkthrough is an attempt to introduce psychological theory into the informal and subjective walkthrough technique. The origin of the cognitive walkthrough approach to evaluation is the code walkthrough in software engineering.

26. What is heuristic evaluation(Understanding)

A heuristic is a guideline or general principle or rule of thumb that can guide a design decision or be used to critique a decision that has already been made. Heuristic evaluation is a method for structuring the critique of a system using a set of relatively simple and general heuristics. Heuristic evaluation can be performed on a design specification so it is useful for
evaluating early design.

27. What are the two distinct evaluation styles? (Understanding)

The two distinct evaluation styles are

1. **Laboratory studies** - Users are taken out of their normal work environment to take part in controlled tests often in a specialist usability laboratory.
2. **Field studies** - The designer or evaluator is taken to the user's work environment in order to observe the system in action.

28. What is Experimental evaluation(Understanding)

It is one of the most powerful methods of evaluating a design is to use a controlled experiment. This provides empirical evidence to support a particular claim or hypothesis.

29. List some of the factors in experimental evaluation? (Understanding)

The factors in experimental evaluations are

- Subjects : Who is the representative, sufficient sample
- Variables : Things to modify and measure
- Hypothesis : What you'd like to show
- Experimental design :How you are going to do it

30. What are two different types of variables in experimental evaluation? (Understanding)

Independent variable (IV) -Elements of the experiment that are manipulated to produce different conditions for comparison. Examples of independent variables in evaluation experiments are interface style, level of help, number of menu items and icon design.

Dependent variables - The variables that can be measured in the experiment, their value is 'dependent' on the changes made to the independent variable. Example is the speed of menu selection.

31. Define hypothesis? (Understanding)

A hypothesis is a prediction of the outcome of an experiment. It is framed in terms of the independent and dependent variables, stating that a variation in the independent variable will cause a difference in the dependent variable

32. What are two different types of variables in experimental evaluation(Analyze)

Variables can be classified as either discrete variables or continuous variables.

Discrete variable: It can only take a finite number of values or *levels*, for example, a screen color that can be red, green or blue.

Continuous variable: It can take any value (although it may have an upper or lower limit), for example a person's height or the time taken to complete a task.

33. What are two types of query technique in evaluation ? (Understanding)

The two types of query techniques are

1. **Interviews** - Interviewing users about their experience with an interactive system provides a direct and structured way of gathering information
2. **Questionnaires** – The questions are fixed in advance and can reach a wider participant group.

34. Lists some of the standard tests categorized by the form of independent and dependent variables(Analyze)

Independent variable	**Dependent variable**	
Parametric		
Two valued	Normal	Student's *t* test on difference of means
Discrete	Normal	ANOVA (ANalysis Of VAriance)
Continuous	Normal	Linear (or non-linear) regression factor analysis
Non-parametric		
Two valued	Continuous	Wilcoxon (or Mann–Whitney) rank-sum test
Discrete	Continuous	Rank-sum versions of ANOVA

Continuous	Continuous	Continuous Spearman's rank correlation
Contingency tests		
Two valued	Discrete	No special test, see next entry
Discrete	Discrete	Contingency table and chi-squared test
Continuous	Discrete	(Rare) Group independent variable and then as above

35. List down factors distinguishing evaluation techniques(Understanding)

The factors distinguishing evaluation techniques are

- the stage in the cycle at which the evaluation is carried out
- the style of evaluation
- the level of subjectivity or objectivity of the technique
- the type of measures provided
- the information provided
- the immediacy of the response
- the level of interference implied
- the resources required.

36. What is universal design? (Apr/May '17) (Understanding)

Universal design is about designing systems so that they can be used by anyone in any circumstance. Universal design means designing for diversity, including:

- people with sensory, physical or cognitive impairment
- people of different ages
- people from different cultures and backgrounds

37. List the design principles of Universal design(Understanding)

The design principles of Universal design

- equitable use
- flexibility in use
- simple and intuitive to use
- perceptible information
- tolerance for error
- low physical effort
- size and space for approach and use

38. Define prototyping (Apr/May '17) (Understand)

Prototypes are experimental and incomplete designs which are cheaply and fast developed. Prototyping is the process of developing prototypes, is an integral part of iterative user-centered design because it enables designers to try out their ideas with users and to gather feedback.

39. Do you think that prototyping will solve all problems associated with user interface design? Give reasons for your answer. (Nov/Dec '17) (Understanding)

Yes, prototyping will solve all problems associated with user interface design. Creating prototypes allows to improve a design concept quickly. It can iteratively revise and refine the idea in a few minutes.

40. Comment on the usage of colours in emergency response panels. (Nov/Dec '17) (Understanding)

COLOR	MEANING	APPLICATION
Red	Danger	Safety cans and signs.
	Stop	Emergency stop bar or button on machinery. Identification of fire equipment.
Fluorescent Orange, Orange-Red	Biosafety	Labels and containers for blood and infectious waste. (Warning labels must be fluorescent orange or orange-red with the biosafety symbol in a contrasting color.)
Yellow	Caution	Tripping, falling and striking hazards. "Flammable, Keep Fire Away" labels on cabinets. Safety cans and containers for explosives, corrosives or unstable materials.
Orange	Warning	Parts of machinery or energized equipment that may cut, crush or otherwise injure. Inside of transmission guards for pulleys, gears, etc.
Green	Safety	Location of first aid equipment. Location of safety equipment, respirators, safety showers, etc.
Blue	Information	Signs and bulletin boards. Specific railroad warnings against starting, using or moving equipment being repaired.
Black, White, Yellow or Combination of Black with White or Yellow	Boundaries	Traffic or housekeeping markings. Stairways, directions and borders.
Magenta or Purple on Yellow	Radiation Caution	X-ray, alpha, beta, gamma, neutron and proton radiation.

41. **What is multithreading? (Understand)(April/May 2018)**

A technique by which a single set of code can be used by several processors at different stages of execution.

42. **Write down the three categories of principles to support usability. (Understand)(April/May 2018).**

ISO defines usability as "The extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use." The word "usability" also refers to methods for improving ease-of-use during the design process.

43. **What are the steps for Interaction design process?(Remember) (Nov/Dec 2018)**

- Requirements
- Analysis
- Design
- Iteration and prototyping
- Implementation and deployment

44. **Write down the techniques used for prototyping? (Remember) (Nov/Dec 2018)**

The Techniques for prototyping

- Storyboards
- Limited functionality simulations
- High-level programming support

45. **What are the two things needed for prototyping methods to work? (Remember) (Apr/May 2019)**

There are two things you need in order for prototyping methods to work:

1. To understand what is wrong and how to improve.
2. A good start point.

46. **Define principles, standards, guidelines and rules(Remember) (Apr/May 2019)**

- **Principles** are derived from knowledge of the psychological, computational and sociological aspects of the problem domains and are largely independent of the technology.
- **Guidelines** are less abstract and often more technology oriented, but as they are also general, it is important for a designer to know what theoretical evidence there is to support them
- **Standards** carry a much higher level of authority, it is more important that the theory underlying them be correct or sound.
- **Rules** are mechanisms for restricting the space of design options, preventing a designer from pursuing design options that would be likely to lead to an unusable system

PART – B

1. Explain in detail the Interaction design process.(Apr/May '17)(Understanding) **.(Apr/May '18)**
2. Discuss about the Navigation design? (Understanding)
3. Illustrate the iteration and prototyping in interaction design. (Understanding)
4. Explain the software life cycle model in HCI software process. (Understanding)
5. What are the techniques used for producing rapid prototypes? Explain. (Analyze)
6. Discuss in detail about design rationale? (Understanding)
7. Explain in detail about the four approaches in Expert analysis for evaluation?(Remember)
8. Discuss about the Nielsen's ten heuristics? (Understanding)
9. Discuss about the Studies of groups of users in evaluation*?* (Understanding)
10. Elucidate briefly the different observational techniques in evaluation? (Analyze)
11. Explain about the various factors distinguishing evaluation techniques. (Analyze)
12. Discuss about the Multimodal interaction(Understanding)
13. Discuss in detail the design for users with disabilities. (Analyze)
14. (i) Narrate the Shneiderman's eight golden rules of Interface Design **(Apr/May '17, '18)** (Understanding)
    (ii)Outline the approaches used for evaluation through expert analysis. **(Apr/May '17)** (Apply)
15. i) Explain the visual tools available for screen design and layout (Remember) **NOV/DEC 2018**
    ii) Outline the activities involved in waterfall model of software life cycle. (Remember) **NOV/DEC 2018**
16. i) List and explain the factors that influence for choosing an evaluation method(Remember) **NOV/DEC 2018**
17. ii) Enumerate Norman's seven principles for transferring difficult task to simple one in design? (Remember) **NOV/DEC 2018**
18. i) Discuss the four phases of interactive design (Remember) **(Apr/May 2019)**
    ii) How do you evaluate the software design (Remember) **(Apr/May 2019)**
19. i) Elaborate on the activities involved in the software development life cycle (Remember) **(Apr/May 201**9)
20. ii) State the rules and guidelines for software design (Remember) **(Apr/May 2019)**

UNIT III - MODELS AND THEORIES
PART A

1. What is Competence models and Performance models. (Understanding)

Competence models, represent the kinds of behavior expected of a user, but they provide little help in analyzing that behavior to determine its demands on the user. Performance models provide analytical power mainly by focusing on routine behavior in very limited applications.

2. Define GOMS(Understanding)

The *GOMS* model is an acronym for Goals, Operators, Methods and Selection. A GOMS description consists of these four elements:

Goals These are the user's goals, describing what the user wants to achieve.

Operators These are the lowest level of analysis. They are the basic actions that the user must perform in order to use the system.

Methods: It is decomposition of a goal into subgoals/operators. For instance, in a certain window manager a currently selected window can be closed to an icon either by selecting the 'CLOSE' option from a pop-up menu, or by hitting the 'L7' function key

Selection: It is means of choosing between competing methods

3. What is CCT? (Understanding)

CCT (Cognitive complexity theory,) has two parallel descriptions: one of the user's goals and the other of the computer system (called the *device* in CCT). The description of the user's goals is based on a GOMS-like goal hierarchy, but is expressed primarily using *production rules.* For the system grammar, CCT uses *generalized transition networks*, a form of *state transition network.*

4. What is BNF ? (Understanding)

BNF (Backus–Naur Form) views the dialog at a purely syntactic level, ignoring the semantics of the language. BNF has been used widely to specify the syntax of computer programming languages, and many system dialogs can be described easily using BNF rules.

5. What are the two types of description in BNF? (Understanding)

The names in the description are of two types: *non-terminals*, shown in lower case, and *terminals*, shown in upper case. Terminals represent the lowest level of user behavior, such as pressing a key, clicking a mouse button or moving the mouse. Non-terminals are higher-level abstractions and it is defined in terms of other non-terminals and terminals by a definition of the form

name ::= expression

6. What is Task-action Grammar (TAG) (Understand) (Nov-Dec 2018)

Task–action grammar (*TAG*) attempts to deal with the consistency in the language's structure and in its use of command names and letters by including elements such as parameterized grammar rules.

7. What is KLM? (Understand)

KLM (Keystroke-Level Model) uses the human-motor understanding as a basis for detailed predictions about user performance. It is aimed at unit tasks within interaction – the execution of simple command sequences.

8. How the task of KLM is split? (Understanding)

The task is split into two phases:

Acquisition of the task, when the user builds a mental representation of the task.

Execution of the task using the system's facilities.

9. List the various operators in the execution phase of KLM? (Understanding)

The model decomposes the execution phase into five different physical motor operators, a mental operator and a system response operator:

K -Keystroking, actually striking keys, including shifts and other modifier keys.

B -Pressing a mouse button.

P -Pointing, moving the mouse (or similar device) at a target

H -Homing, switching the hand between mouse and keyboard.

D -Drawing lines using the mouse.

M -Mentally preparing for a physical action.

R -System response which may be ignored if the user does not have to wait for it, as in copy typing.

10. List the several organizational issues? (Understanding)

There are several organizational issues that affect the acceptance of technology by users and that must therefore be considered in system design:

– systems may not take into account conflict and power relationships

– those who benefit may not do the work

– not everyone may use systems

11. What is Three-state model(Understanding)

The three state model contains three states – State 0, State 1, State 2. The devices like mouse, trackball, light pen though they are similar from the application's viewpoint, they have very different sensory–motor characteristics. The *three-state model*, captures some of these crucial distinctions.

For example for a light pen, when its button is not depressed, it is in state 1, and when its button is down, state 2. The light pen has a third state, when it is not touching the screen. In this state the system cannot track the light pen's position. This is called state 0.

Light Pen Transitions

12. Who are stakeholders? (Understanding)

A stakeholder can be defined as anyone who is affected by the success or failure of the system.

13. Who are stakeholders? Mention the types? (Understand) (Apr/May 2019)

Primary stakeholders are people who actually use the system – the end-users.

Secondary stakeholders are people who do not directly use the system, but receive output from it or provide input to it (for example, someone who receives a report produced by the system).

Tertiary stakeholders are people who do not fall into either of the first two categories but who are directly affected by the success or failure of the system (for example, a director whose profits increase or decrease depending on the success of the system).

14. Define Custom Methodology? (Understanding)

CUSTOM focuses on establishing stakeholder requirements(all stakeholders are considered, not just the end-users). It is applied at the initial stage of design when a *product opportunity* has been identified, so the emphasis is on capturing requirements. It is a forms-based methodology, providing a set of questions to apply at each of its stages.

15. List the six stages of Custom analysis?(Remember)

There are six key stages to carry out in a CUSTOM analysis

- ✓ Describe organizational context, including primary goals, physical characteristics, political and economic background
- ✓ Identify and describe stakeholders including personal issues, role in the organization and job
- ✓ Identify and describe work-groups whether formally constituted or not
- ✓ Identify and describe task–object pairs i.e. tasks to be performed and objects used
- ✓ Identify stakeholder needs: stages 2–4 described in terms of both current and proposed system - stakeholder needs are identified from the differences between the two

- ✓ Consolidate and check stakeholder requirements against earlier criteria

16. What is Open System Task Analysis (OSTA)? (Understanding)

OSTA is a socio-technical approach, which attempts to describe what happens when a technical system is introduced into an organizational work environment. Like CUSTOM, OSTA specifies both social and technical aspects of the system.

17. List the eight stages of Open System Task Analysis?(Analyze)

There are eight stages to carry out OSTA

a. Primary task identified in terms of users' goals
b. Task inputs to system identified
c. External environment into which the system will be introduced is described, including physical, economic and political aspects
d. Transformation processes within the system are described in terms of actions performed on or with objects
e. Social system is analyzed, considering existing internal and external work-groups and relationships
f. Technical system is described in terms of configuration and integration with other systems
g. Performance satisfaction criteria are established, indicating social and technical requirements of system
h. New technical system is specified

18. Define Soft Systems Methodology (SSM) (Understanding)

Soft systems methodology (SSM) arises from the same tradition but takes a view of the organization as a system of which technology and people are components.

19. List the seven stages of Soft Systems Methodology(Analyze)

The seven stages of Soft Systems Methodology

- recognition of problem and initiation of analysis
- detailed description of problem situation
  - rich picture
- generate root definitions of system
  - CATWOE
- conceptual model - identifying transformations
- compare real world to conceptual model
- identify necessary changes
- determine actions to effect changes

20. List the elements of root definitions? (Understanding)

Root definitions are described in terms of specific elements, summarized using the acronym, CATWOE:

Clients – those who receive output or benefit from the system.

Actors – those who perform activities within the system.
Transformations – the changes that are effected by the system. This is a critical part of the root definition as it leads to the activities that need to be included in the next stage. These 'transform' the inputs of the system into the required outputs.
Weltanschauung – (from the German) meaning world view. This is how the system is perceived in a particular root definition.
Owner – those to whom the system belongs, to whom it is answerable and who can authorize changes to it.
Environment – the world in which the system operates and by which it is influenced

21. What is participatory design? (Understanding)

Participatory design is a philosophy that encompasses the whole design cycle. It is design in the workplace, where the user is involved not only as an experimental subject or as someone to be consulted when necessary but as a member of the design team. Users are therefore active collaborators in the design process, rather than passive participants whose involvement is entirely governed by the designer

22. What are the three levels of participation in Effective Technical and Human Implementation of Computer-based Systems (ETHICS)(Analyze)

Consultative – the weakest form of participation where participants are asked for their opinions but are not decision makers.
Representative – a representative of the participant group is involved in the decision making process.
Consensus – all stakeholders are included in the decision-making process

23. Define Ethnography? (Understanding)

Ethnography is based on very detailed recording of the interactions between people and between people and their environment. It has a special focus on social relationships and how they affect the nature of work.

24. List the various levels of communication? (Understanding)

The various levels of communication are

a. Face-to-face communication
b. Conversation
c. Text based communication
d. Group working

25. What is back channel in face-to-face communication? (Understanding)

A back channel is a sound or gesture like nods, grimaces, shrugs of the shoulder and small noises made to give continuity to a conversation by a person who is listening to another.

26. What are the uses for theories of conversation in CSCW(computer-supported cooperative work**)? (Understanding)**

There are three uses for theories of conversation in CSCW.

1. They can be used to analyze transcripts, for example from an electronic conference. This can help us to understand how well the participants are

coping with electronic communication.
2. They can be used as a guide for design decisions – an understanding of normal human–human conversation can help avoid blunders in the design of electronic media.
3. They can be used to drive design – structuring the system around the theory

27. What is meant by utterances and adjacency pairs? (Understanding)

The speech within each turn is called an utterance. The utterances of the conversation can be grouped into pairs: a question and an answer, a statement and an agreement. The answer or response will normally follow directly after the question or statement and so these are called adjacency pairs

28. What are the two types of context within conversation? (Understanding)

The two types of context within conversation are

Internal context – Dependence on earlier utterances. For example, when Brian says 'masses' in the last transcript, this is meaningful in the light of Alison's question 'and lots of chocolate?'. This in turn is interpreted in the context of Brian's original offer of gateau(a rich cake).

External context – Dependence on the environment. For example, if Brian had said simply 'do you want one?', this could have meant a slice of gateau, or, if he had been holding a bottle, a glass of wine, or, if accompanied by a clenched fist, a punch on the nose.

29. How utterances are classified based on task related conversation(Understanding)

Based on task-related conversation, the utterances can be classified into three kinds:

1. **Substantive** directly relevant to the development of the topic.
2. **Annotative** points of clarification, elaborations, etc.
3. **Procedural** talking about the process of collaboration itself

30. List out the types of textual communication? (Apr/May '17) (Analyze)

There are four types of textual communication in current groupware:

1. **Discrete** – directed message as in email. There is no explicit connection between different messages, except in so far as the text of the message refers to a previous one.
2. **Linear** – participants messages are added in (usually temporal) order to the end of a single transcript.
3. **Non-linear** – when messages are linked to one another in a hypertext fashion.
4. **Spatial** – where messages are arranged on a two-dimensional surface

31. What are properties of grounding constraints? (Understanding)

The grounding process is linked strongly with the types of channels through which the conversant communicate. The properties of these channels in terms

of *grounding constraints* are

- **Co temporality** – an utterance is heard as soon as it is said (or typed).
- **Simultaneity** – the participants can send and receive at the same time.
- **Sequence** – the utterances are ordered

32. What are the two coping strategies in text based conversation? (Understanding)

The two coping strategies to increase the chunk size of messages in order to reduce the number of interactions required to complete a task are

Multiplexing- The conversant hold several conversations in parallel, each message referring to several topics. In terms of the conversation tree, this corresponds to going down several branches at once.

Eagerness - The participants can foresee the possible course of the interaction and frame communications which encompass many of the possibilities: for example, 'If you don't pay within seven days we will take you to court'. Eagerness is a sort of depth-first strategy. The participant explores a branch of the tree guessing the other participant's responses

33. Define hypertext, Multimedia and WWW? (Understanding)

Hypertext allows documents to be linked in a nonlinear fashion. Multimedia incorporates different media: sound, images, video. The world wide web is a global hypermedia system.

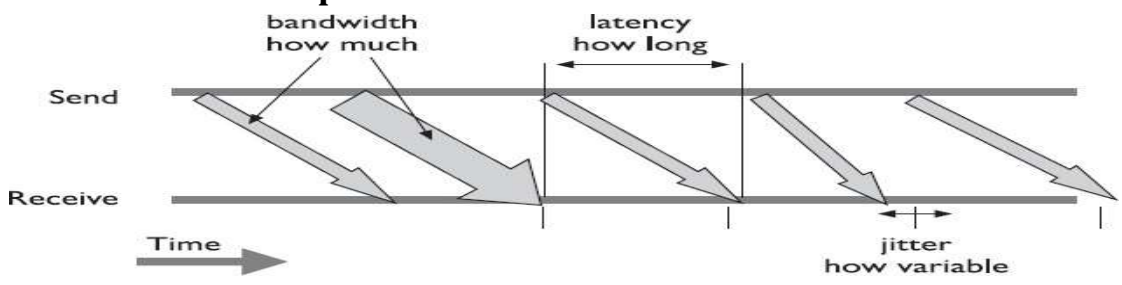
34. Highlight the application of hypermedia? (Apr/May '17) (Understanding)

- Rapid prototyping
- Help and documentation
- Education and e-learning
- Collaboration and community
- E-commerce

35. What are the network issues in web technology(Understanding)

The network issues are

- **Bandwidth** : how much information per second**.**
- **Latency:** how long it takes (delay)
- **Jitter :** how consistent is the delay
- **Reliability:** some messages are lost , … need to be resent … increases jitter
- **Connection set-up :** need to 'handshake' to start



PART – B

1. Write in detail about the Cognitive complexity theory(Understanding)
2. Discuss about Linguistic Models(Understanding)
3. Explain about the various physical models? (Understanding)
4. Explain about the cognitive architecture? (Understanding)
5. Discuss about the various organizational issues. (Analyze)
6. Explain in detail about the various socio-technical models? (Remember)
7. Discuss about the Soft Systems Methodology? (Understanding)
8. Explain in detail about Face-to-Face Communication? (Understanding)
9. Explain about conversation in communication? (Understanding)
10. Discuss about Text based communication? (Analyze)
11. Discuss in detail about hypertext? (Understanding)
12. Explain about the various issues in Web technology? (Analyze)
13. Explain about the static web content? (Understanding)
14. Explain about the dynamic web content? (Understanding)
15. What is a cognitive model ? Classify cognitive models and discuss the same. **(Apr/May '17)** (Remember)
16. (i) Who is a stakeholder? Outline the types of stake holders and appraise the stakeholders for an airline booking system? **(Apr/May '17)** (Remember)
    (ii)Explain the stages involved in CUSTOM methodology analysis **(Apr/May '17)** (Remember)
17. Consider the case of preparing a group presentation for a software project. Describe the stages in specifying and designing UI for the same. **(Nov/Dec '17)**(Create)
18. i) Explain the concept of key state level model (Remember) **(Nov/Dec '18)**
    ii) Describe the stages of Open System Task Analysis (OSTA) (Remember) **(Nov/Dec '18)**
19. i) What are the four types of textual communication? Explain (Remember) **(Nov/Dec '18)**
    ii) Write note on Dynamic web content (Remember) **(Nov/Dec '18)**
20. With a text editor example, explain the Cognitive Complexity Theory (Apply) **(Apr/May 2019)**
21. Discuss about text-based communication and the relative merits and features of linear text and hypertext systems (Remember) (**Apr 2019)**

UNIT IV –MOBILE HCI

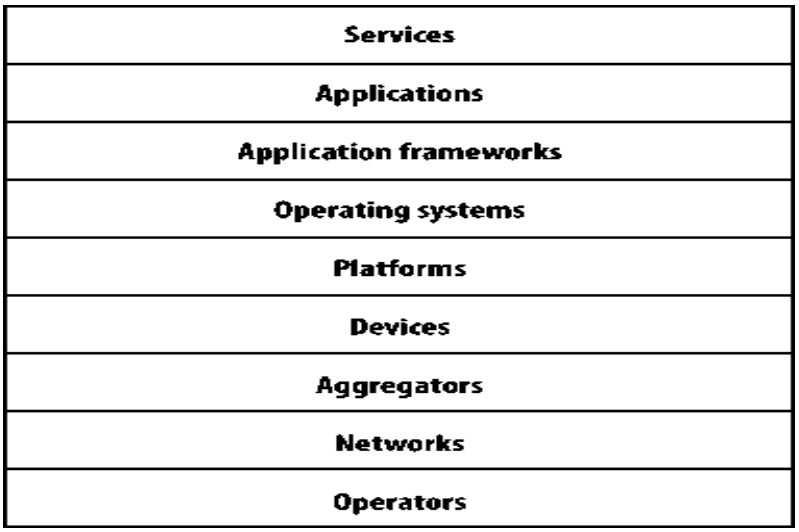
PART –A

1. What is mobile eco system? (Understanding)

Mobile Ecosystem is collection of multiple devices (mobile phones, Tablet etc), software (operating system, development tools, testing tools etc.), companies (device manufacturers, carrier, apps stores, development/testing companies, etc.) etc., and the process by which data (sms, bank transactions etc.), is

transferred /shared by a user from one device to another device or by the device itself based on some programs (Birth day , Wedding Messages , Calendar)

2. **What are the layers of mobile eco system ? (Nov/Dec '17) (Understanding)**



3. **Define mobile platform & its types? (or) Identify the categories of mobile platforms? (Apr/May '17) (Understanding)**

   A mobile platform

   - provide access to the devices.
   - run software and services on each of these devices
   - is a core programming language in which all of your software is written.

   three types : 1) licensed, 2) proprietary, 3) open source.

4. **Define & List the licensed platforms(Understanding)**

   Licensed platforms are sold to device makers for nonexclusive distribution on devices.

   The goal is to create a common platform of development Application Programming Interfaces (APIs) that work similarly across multiple devices with the least possible effort required to adapt for device differences. List of licensed platforms are

   - Java Micro Edition (Java ME)
   - Binary Runtime Environment for Wireless (BREW)
   - Windows Mobile
   - LiMo

5. **Define & List the proprietary platforms ? (Understanding)**

   Proprietary platforms are designed and developed by device makers for use on their devices. They are not available for use by competing device makers. List of proprietary platforms

   - Palm
   - BlackBerry
   - iPhone

6. **Define open source platform and give example ? (Understanding)**
   Open source platforms are mobile platforms that are freely available for users to download, alter, and edit.
   Ex: Android is one of these platforms. It is developed by the Open Handset Alliance, which is spearheaded by Google. The Alliance seeks to develop an open source mobile platform based on the Java programming language.

7. **What is Application framework ? (Understanding)**
   Application frameworks run on top of operating systems, sharing core services such as communications, messaging, graphics, location, security, authentication, and many others. Application frameworks are used to create applications, such as a game, a web browser, a camera, or media player

8. **What is mobile medium type ? (Understanding)**
   The mobile medium type is the type of application framework or mobile technology that presents content or information to the user. It is a technical approach regarding which type of medium to use.

9. **What are the mobile application type? (Understanding)**
   - SMS
   - Mobile Website
   - Mobile Web widgets
   - Mobile Web application
   - Native Applications
   - Games

10. **Compare the various mobile application type(Analyze)**

	Device support	Complexity	User experience	Language	Offline support	Device features
SMS	All	Simple	Limited	N/A	No	None
Mobile websites	All	Simple	Limited	HTML	No	None
Mobile web widgets	Some	Medium	Great	HTML	Limited	Limited
Mobile web applications	Some	Medium	Great	HTML, CSS, JavaScript	Limited	Limited
Native applications	All	Complex	Excellent	Various	Yes	Yes
Games	All	Complex	Excellent	Various	Yes	Yes

11. Write the pros and cons of game applications(Analyze)

Pros

- They provide a simple and easy way to create an immersive experience.
- They can be ported to multiple devices relatively easily.

Cons

- They can be costly to develop as an original game title.
- They cannot easily be ported to the mobile web.

12. Define application context(Understanding)

The application context deals with the user experience; context is the surroundings in which information is processed.

13. Compare the various application context type(Understanding)

	User experience type	Task type	Task duration	Combine with
Utility	At-a-glance	Information recall	Very short	Immersive
Locale	Location-based	Contextual information	Quick	Immersive
Informative	Content-based	Seek information	Quick	Locale
Productivity	Task-based	Content management	Long	Utility
Immersive	Full screen	Entertainment	Long	Utility, locale

14. What Is Information Architecture? (Understanding)

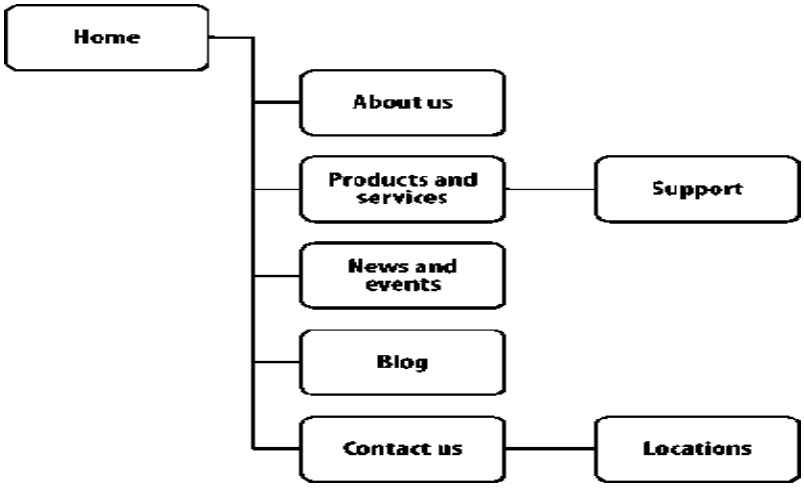
- The structural design of shared information environments
- The combination of organizations, labeling, search, and navigation systems within websites and intranets.
- The art and science of shaping information products and experiences to support usability and find ability
- An emerging discipline and community of practice focused on bringing principles of design and architecture to the digital landscape

15. List the disciplines of information architecture(Understanding)

- Information architecture
- Interaction design
- Information design
- Navigation design
- Interface design

16. What is site map and give example ? (Understanding)

Site maps are a classic information architecture deliverable. They visually represent the relationship of content to other content and provide a map for how the user will travel through the informational space.



17. Define Click stream(Understanding)

Click stream is a term used for showing the behavior on websites, displaying the order in which users travel through a site's information architecture, usually based on data gathered from server logs.

18. What are Wireframes ? (Understanding)

- Wireframes are a way to lay out information on the page, also referred to as information design.
- Site maps show how our content is organized in our informational space; wireframes show how the user will directly interact with it.
- wireframes lack the capability to communicate more complex, often in-place, interactions of mobile experiences.
-

19. List the mobile prototyping ?(Understanding)

- Paper prototypes
- Context prototype
- HTML prototypes

20. List the Elements of Mobile Design (Understanding)

1. Context - core to the mobile experience
2. Message - the overall mental impression you create explicitly through visual design
3. Look and Feel – is used to evoke action ,how the user will use an interface
4. Layout – informs how the user will visually process the page
5. Color –
6. Typography- the style and appearance of printed matte
7. Graphics- the images that are used to establish or aid a visual experience.

21. What are the two distinct types of navigation layouts for mobile devices? (Understanding)

The two distinct types of navigation layouts for mobile device touch and scroll.

22. Give the Different devices with color depths(Understanding)

Bit depth	Supported colors	Description	Example devices
12-bit	4,096 colors	Used with older phones; dithering artifacts in photos can easily be seen.	Nokia 6800
16-bit	65,536 colors	Also known as HighColor; very common in today's mobile devices. Can cause some banding and dithering artifacts in some designs.	HTC G1, BlackBerry Bold 9000, Nokia 6620

Bit depth	Supported colors	Description	Example devices
18-bit	262,144 colors	Used in mobile devices to offer Truecolor (see following entry) levels through dithering. Limited banding may be seen.	Samsung Alias, Sony Ericsson TM506
24-bit	16.7 million colors	Also known as Truecolor; supports millions of colors and produces little banding.	iPhone, Palm Prē, Nokia N97

23. Define Iconography (Understanding)

Iconography is useful to communicate ideas and actions to users in a constrained visual space. The challenge is making sure that the meaning of the icon is clear to the user.

24. List the Design tools and interface tool kits or Give examples of Mobile design tools (Apr/May '17) (Remember)

Mobile framework	Design tool	Interface toolkits
Java ME	Photoshop, NetBeans	JavaFX, Capuchin
BREW	Photoshop, Flash	BREW UI Toolkit, uiOne, Flash
Flash Lite	Flash	Flash Lite
iPhone	Photoshop, Interface Builder	iPhone SDK

Mobile framework	Design tool	Interface toolkits
Android	Photoshop, XML-based themes	Android SDK
Palm webOS	Photoshop, HTML, CSS, and JavaScript	Mojo SDK
Mobile web	Photoshop, HTML, CSS, and JavaScript	W3C Mobile Web Best Practices
Mobile widgets	Photoshop, HTML, CSS, and JavaScript	Opera Widget SDK, Nokia Web Runtime
Mobile web apps	Photoshop, HTML, CSS, and JavaScript	iUI, jQTouch, W3C Mobile Web App Best Practices

25. Describe the pros and cons of mobile web sites. (Nov/Dec '17) (Analyze)

The Pros:

1. **A single website**. It's easier to administer just one website for all devices.
2. **A single URL.** This makes sure your users will find you on mobile devices without having to wait for redirects, especially helpful on slower connections.
3. **Easy SEO.** There is no need to create specific content for mobile devices, while you still enjoy the benefits of your desktop website SEO on mobile devices.
4. **Easy marketing.** No extra work for the marketing department is required to promote your website on mobile.
5. **Low cost.** Simple math — one website is cheaper than two.

The Cons:

1. **A single website.** Having just one website for all devices may be easy for you, but not always for your users. You will often need to put different emphasis on the same page in order to maximize conversions using the advantages of the platform.
2. **Technical.** As responsive web design is a relatively new technology, there are still some outdated devices with old browsers that will load the website too slowly or even not fully.
3. **User Experience.** Mobile is a completely different experience than desktop, so having a single, even responsive website, may harm your overall UX on both platforms. If you try to satisfy both mobile and desktop users with the same user interface, you may end up satisfying no one.

26. What is Cocoa Touch ? (Remember)(April/May 2018)

Cocoa Touch is a user interface framework provided by Apple for building software applications for products like iPhone, iPad and iPod Touch. It is primarily written in Objective C language and is based on Mac OS X.

27. Highlight the importance of mobile applications (Remember) (April/May 2018)

- Improves Efficiency.
- Offers High Scalability.
- Secures Your App Data.
- Integrates With Existing Software.
- Easy to Maintain.
- Improves Customer Relationship.
- Facilitates New Client Data Retrieval.
- Provides Real-time Project Access.

28. Give some examples of world largest mobile operators? (Remember) (Nov/Dec 2018)

- Airtel
- Vodofone

- Reliance jio
- BSNL

29. Define Color palettes? (Remember) (Nov/Dec 2018)

Defining color palettes can be useful for maintaining a consistent use of color in your mobile design. Color palettes typically consist of a predefined number of colors to use throughout the design.

30. Why JavaScript and Ajax have been ignored for web application on the mobile phones (Remember) (Apr/May 2019)

- Java script consumes more processor power and therefore more battery life.
- Ajax applications more data from the network and therefore uses more radio and battery life

31. List the pros and cons of mobile game application (Remember) (Apr/May 2019)

Pros:

- Full access to the device, in software and hardware
- Enhanced user experience
- Vision from app stores, and integration with wearables

Cons:

- Different programming languages and skills depending on operating system.
- High costs and lengthy development
  Periods

PART – B

1. Describe the following (Understanding)
   a. Mobile EcoSystem
   b. Platforms
2. What are Application Framework and explain in detail(Understanding)
3. Appraise the types of mobile applications with examples **(Apr/May '17)** (Analyze)
4. Explain the various mobile information architecture(Understanding)
5. List and explain the elements of mobile design **(Apr/May '17)** (Understanding)
6. Explain briefly about mobile information architecture. **(Nov/Dec '17)** (Understanding)(**April/May 2018)**
7. i)Describe the roles of major mobile operating system (Remember**) (Nov/Dec '18)**

ii) Tabulate the various mobile design tools and interface tool kits (Remember) **(Nov/Dec '18)**

8. Elaborate on Mobile application medium types (Remember**) (Nov/Dec '18)**
9. With neat diagram of mobile ecosystem, discuss its platforms and application frameworks. (Remember) **(Apr/May '19)**

UNIT V- WEB INTERFACE DESIGN
PART – A

1. List the events for cueing the user during a drag and drop? (Understanding)

There are at least 15 events available for cueing the user during a drag and drop interaction.

1. Page Load
2. Mouse Hover
3. Mouse Down
4. Drag Initiated
5. Drag Leaves Original Location
6. Drag Re-Enters Original Location
7. Drag Enters Valid Target
8. Drag Exits Valid Target
9. Drag Enters Specific Invalid Target
10. Drag Is Over No Specific Target
11. Drag Hovers Over Valid Target
12. Drag Hovers Over Invalid Target
13. Drop Accepted
14. Drop Rejected
15. Drop on Parent Container

2. List few actors in drag and drop? (Understanding)

During each event we can visually manipulate a number of *actors*. The page elements available include:

- Page (e.g., static messaging on the page)
- Cursor
- Tool Tip
- Drag Object (or some portion of the drag object, e.g., title area of a module)
- Drag Object's Parent Container
- Drop Target

3. What are the various approaches for Drag and Drop Modules(Understanding)(April/May 2018)

The various approaches for Drag and Drop Modules are:

Placeholder targeting - Most explicit way to preview the effect.

Midpoint boundary - Requires the least drag effort to move modules around.

Full-size module dragging - Coupled with placeholder targeting and midpoint boundary detection, it means drag distances to complete a move are shorter.

Ghost rendering - Emphasizes the page rather than the dragged object. Keeps the preview clear.

4. Write the various selection patterns?(Analyze)

Toggle Selection : Checkbox or control-based selection.
Collected Selection :Selection that spans multiple pages.
Object Selection :Direct object selection.
Hybrid Selection :Combination of Toggle Selection and Object Selection

5. What are contextual tools? (Understanding)

Contextual Tools are the Web's version of the desktop's right-click menus. Instead of having to right-click to reveal a menu, we can reveal tools in context with the content

6. State the ways to reveal contextual tools? (Understanding)

The various ways to reveal contextual tools

Always-Visible Tools : Place Contextual Tools directly in the content.

Hover-Reveal Tools : Show Contextual Tools on mouse hover.

Toggle-Reveal Tools :A master switch to toggle on/off Contextual Tools for the page.

Multi-Level Tools : Progressively reveal actions based on user interaction.

Secondary Menus : Show a secondary menu (usually by right-clicking on an object).

7. What are the issues with showing contextual tools in an overlay (Understanding)

The various issues with showing contextual tools in an overlay:

1. Providing an overlay feels heavier. An overlay creates a slight contextual switch for the user's attention.
2. The overlay will usually cover other information—information that often provides context for the tools being offered.
3. Most implementations shift the content slightly between the normal view and the overlay view, causing the users to take a moment to adjust to the change.
4. The overlay may get in the way of navigation. Because an overlay hides at least part of the next item, it becomes harder to move the mouse through the content without stepping into a "landmine."

8. What is a mutton in contextual tools? (Understanding)

A variation on Multi-Level Tools is the "mutton" (menu + button = mutton). Muttons are useful when there are multiple actions and we want one of the actions to be the default. Yahoo! Mail uses a mutton for its "Reply" button

9. Mention the ways in which contextual tools can be used? (Understand) (Apr/May 2019)

Contextual Tools are useful for reducing the user's path to completing a task. By placing tools near the point of focus and making these tools easy to activate, you can create a lightweight interaction

10. What are overlays, inlays, virtual pages and process flow? (Understanding)

Overlays - Instead of going to a new page, a mini-page can be displayed in a lightweight layer over the page.

Inlays - Instead of going to a new page, information or actions can be inlaid within the page.

Virtual Pages - By revealing dynamic content and using animation, we can extend the virtual space of the page.

Process Flow - Instead of moving from page to page, sometimes we can create a flow within a page itself. What are the types of overlays? (Apr/May '17) (Understanding)

The three specific types of overlays are Dialog Overlays, Detail Overlays, and Input Overlays

11. What is Light box effect? (Understanding)

It is one technique employed in dialog overlays. In photography a lightbox provides a backlit area to view slides. On the Web, this technique has come to mean bringing something into view by making it brighter than the background. In practice, this is done by dimming down the background

12. What is Modal and Non-Modal(Understanding)

A modal dialog box must be closed (hidden or unloaded) before you can continue working with the rest of the application. For example, a dialog box is modal if it requires you to click OK or Cancel before you can switch to another form or dialog box.

Non-Modal dialog boxes allows to shift the focus between the dialog box and another form without having to close the dialog box.

13. What is List Inlay? (Understanding)

Lists are a great place to use Inlays. Instead of requiring the user to navigate to a new page for an item's detail or popping up the information in an Overlay, the information can be shown with a List Inlay in context.

14. What is Accordion? (Understanding)

The Accordion is an interface element that employs the List Inlay pattern to show only one open panel in a list at a time.

15. Give some guidelines for use of inlays and overlays?(Remember)

- Use an overlay when there may be more than one place a dialog can be activated from (the exception may be showing details for items in a list).
- Use an overlay to interrupt the process.
- Use an overlay if there is a multi-step process.
- Use an inlay when you are trying to avoid covering information on the page needed in the dialog.
- Use an inlay for contextual information or details about one of many items (as in a list): a typical example is expanding list items to show detail.

16. Mention the patterns that supports Virtual pages?(Remember) (Apr/May 2019)

Patterns that support virtual pages include:

- Virtual Scrolling
- Inline Paging
- Scrolled Paging
- Panning
- Zoomable User Interface

17. Give examples for virtual Scrolling to manage the virtual space(Understanding)

Virtual Scrolling demonstrate three different ways to manage the virtual space:

- Yahoo! Mail creates the illusion that all data has been loaded up-front by having the scrollbar reflect the total virtual space.
- Microsoft Live Search creates the virtual illusion as the user moves down through the search results.
- And PicLens does the same with the caveat that it shows a virtual window in the larger virtual space (by only providing a scroller control for where the user is and some before and after context).

18. What is Carousel ? (Understanding)

A Carousel provides a way to page-in more data by scrolling it into view. On one hand it is a variation on the Virtual Scrolling pattern. In other ways it is like Virtual Paging since most carousels have paging controls. The additional effect is to animate the scrolled content into view.

19. List some issues in Virtual panning(Understanding)

Issues in Virtual Panning are 1) Natural Visual Construct 2)Gestures

20. What is the main difference between Flicking and virtual panning(Understanding)

Flicking is similar to panning yet has some differences. With Virtual Panning the canvas only moves while the mouse is dragging it around. With flicking, if the user starts the dragging operation and releases, the canvas will continue moving with some momentum. The canvas slows in such a way as to mimic real-world forces.

21. What is Zoomable User Interface? (Understanding)

A Zoomable User Interface (ZUI) is another way to create a virtual canvas. Unlike panning or flicking through a flat, two-dimensional space, a ZUI allows the user to also zoom in to elements on the page. This freedom of motion in both 2D and 3D supports the concept of an infinite interface.

22. What is a Google Blogger(Understanding)

The site Google Blogger generally makes easy to create and publish blogs. One thing it does not make easy, though, is deleting comments that others may leave on your blog. This is especially difficult when you are the victim of hundreds of spam comments left by nefarious companies hoping to increase their search ranking.

23. How to delete the comment in a Blogger? (Understanding)

Blogger forces you to delete these comments through a three-step process. Each step is an individual page, all punctuated with a page refresh

24. List the various patterns of process flow? (Understanding)

The various Process Flow patterns are

- Interactive Single-Page Process
- Inline Assistant Process
- Configuration Process
  - Overlay Process
  - Static Single-Page Process

25. List some of the Best Practices for Static Single-Page Process? (Understanding)

- Use a multi-page process when the process is complex.
- Use a multi-page process when you want to hide the previous context (and the next) and bring the focus to a single task in the steps.
- Use a Static Single-Page Process when you only have a few steps and want to avoid taking the chance that a user will quit while moving from page to page.
- Use visual treatments to make the number of steps seem fewer.
- Provide clues as to where the user is and how much is left in a multi-step operation.
- Gather as many defaults as possible to simplify a flow.
- Use engagement, color visuals, interactivity, and simple visual styles to make the steps seem fewer.
- Put lightweight tasks up front in a multi-step operation

26. What is auto complete pattern? (Apr/May '17) (Remember)

The auto complete pattern is used in combination with a standard input text box that is labeled to match the user's expectation of what field will be searched against .As the user types in data, a list of suggested items that match the inputted data is displayed.

27. Suggest some of the best practices to keep in mind during the design of input overlay. (Nov/Dec '17) (Remember)

1. Use overlays very sparingly
2. Don't suddenly open overlays
3. Darken the page behind the overlay
4. Allow users to click (or tap) away (most of the time)
5. Always provide a clear close option
6. Don't include multiple steps
7. Don't cram in too much
8. Include important information
9. Try to avoid using overlays for mobile designs
10. Ensure that overlays are accessible

28. Define object selection.(Remember)(April/May 2018)

Object–action interface, also abbreviated as OAI, is an extension to the graphical user interface, especially related to direct manipulation user interface and it can help to create better human-computer interfaces and increase the usability of a

product.

29. List any four principles of designing rich web interface? (Remember) (Nov/Dec 2018)

Some of the principles of designing rich web interface are

- The structure principle
- The simplicity principle
- The tolerance principle
- The feedback principle
-

30. What do you mean by Inlay? (Remember) (Nov/Dec 2018)

Inlays - Instead of going to a new page, information or actions can be inlaid within the page

PART – B

1. Discuss in detail the purpose of drag and drop?(Analyze) **(Apr/May 2019)**
2. Discuss in detail the various types of selection patterns? (Understanding)
3. Explain in detail the various ways to reveal contextual tools? (Understanding)(**April/May 2018)**
4. Discuss about the three types of overlays? (Understanding) **(Apr/May 2019)**
5. Discuss about the various types of inlays?(Analyze)
6. Explain in detail about the various patterns that support virtual pages? (Understanding)
7. Discuss in detail about the process flow patterns(Understanding)
8. How are contextual tools used in the design of rich web UI? Illustrate and compare with suitable examples**. (Nov/Dec '17)(**Analyze)
9. How are virtual pages used in the design of rich web UI? Illustrate and compare with suitable examples. **(Nov/Dec '17)** (Analyze)
10. Summarize the principles for designing rich web interface. **(Apr/May '17)** (Analyze)
11. i) Write notes on contextual tools (Remember) (**Nov/Dec '18)**
    ii) Brief about the different types of overlays (Remember) **(Nov/Dec '18)**
12. Explain the steps involved in designing a web interface. (Remember) **(Nov/Dec '18)**