HCI QP Sessional Answers

1.a) Explain in detail about human input and output channels.

Ans.1.a)

A person's interaction with the outside world occurs through information being received and sent: input and output. In an interaction with a computer the user receives information that is output by the computer and responds by providing input to the computer–the user's output becomes the computer's input and vice versa.

There are five major senses: sight, hearing, touch, taste and smell. Of these, the first three are the most important to HCI. Taste and smell do not currently play a significant role in HCI, and it is not clear whether they could be exploited at all in general computer systems, although they could have a role to play in more specialized systems (smells to give warning of malfunction, for example) or in augmented reality systems. vision, hearing and touch are central.

1. Vision

Human vision is a highly complex activity with a range of physical and perceptual limitations, We can roughly divide visual perception into two stages: the physical reception of the stimulus from the outside world, and the processing and interpretation of that stimulus.

2. Hearing

The sense of hearing is often considered secondary to sight, but we tend to underestimate the amount of information that we receive through our ears. hearing begins with vibrations in the air or sound waves. The ear receives these vibrations and transmits them, through various stages, to the auditory nerves. The ear comprises three sections, commonly known as the Outer ear, middle ear and inner ear.

3. Touch

Touch provides us with vital information about our environment. It tells us when we touch something hot or cold and can therefore act as a warning. It also provides us with feedback when we attempt to lift an object, for example. Consider the act of picking up a glass of water. If we could only see the glass and not feel when our hand made contact with it or feel its shape, the speed and accuracy of the action would be reduced. This is the experience of users of certain virtual reality games: they can see the computer-generated objects which they need to manipulate but they have no physical sensation of touching them.

4. Movement

A simple action such as hitting a button in response to a question involves a number of processing stages. The stimulus (of the question) is received through the sensory receptors and transmitted to the brain. The question is processed, and a valid response generated. The brain then tells the appropriate muscles to respond. Each of these stages takes time, which can be roughly divided into reaction time and movement time.

1.b) What are the different types of memory in human brain?

Ans.1.b)

Our memory contains our knowledge of actions or procedures. It allows us to repeat actions, to use language, and to use new information received via our senses. It also gives us our sense of identity, by preserving information from our past experiences.

Memory is the second part of our model of the human as an information-processing system. Memory is associated with each level of processing. Bearing this in mind, we will consider the way in which memory is structured and the activities that take place within the system. It is generally agreed that there are three types of memory or memory function: sensory buffers, short-term memory or working memory, and long-term memory.

1. Sensory memory

The sensory memories act as buffers for stimuli received through the senses. A sensory memory exists for each sensory channel: iconic memory for visual stimuli, echoic memory for aural stimuli and haptic memory for touch. These memories are constantly overwritten by new information coming in on these channels.

2. Short-term memory

Short-term memory or working memory acts as a "scratch-pad" for temporary recall of information. It is used to store information which is only required fleetingly. Short-term memory can be accessed rapidly, in the order of 70 ms. It also decays rapidly, meaning that information can only be held there temporarily, in the order of 200 ms. Short-term memory also has a limited. capacity..

3. Long-term memory

If short-term memory is our working memory or _scratch-pad_, long-term memory is our main resource. Here we store factual information, experiential knowledge, procedural rules of behavior – in fact, everything that we _know_. It differs from short-term memory in a number of significant ways. First, it has a huge, if not unlimited, capacity. Secondly, it has arelatively slow access time of approximately a tenth of a second. Thirdly, forgetting occurs more slowly in long-term memory, if at all.

2.a) Define Problem Solving & list the theories involved in problem solving.

Ans.2.a)

Problem solving

Human problem solving is characterized by the ability to adapt the information we have to deal with new situations often solutions seem to be original and creative. There are a number of different views of how people solve problems. The Gestalt view that problem solving involves both reuse of knowledge and insight. This has been largely superseded but the questions it was trying to address remain and its influence can be seen in later research. In the 1970s by Newell and Simon, was the problem space theory, which takes the view that the mind is a limited information processor.

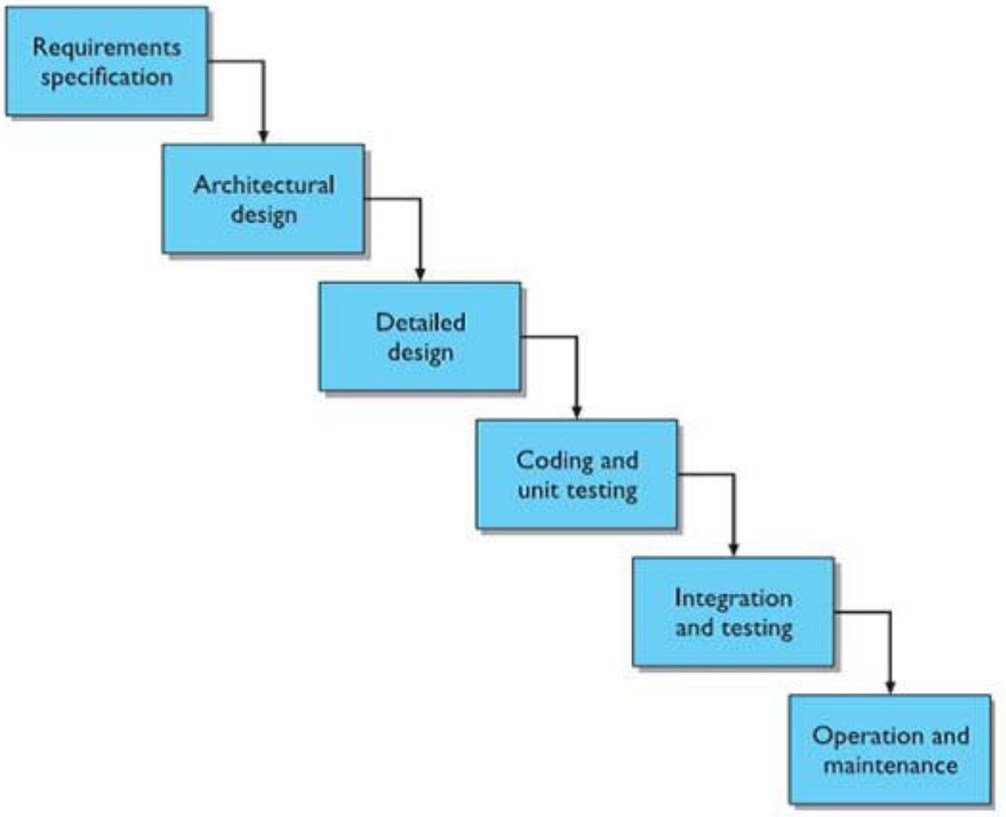
2.b) Explain in detail about models of interaction.

Ans.2.b)

3.a) Explain the software life cycle model in HCI software process.

Ans.3.a)

The software life cycle refers to the stages involved in the development of a software product with a focus on human-computer interaction. The software life cycle process in HCI software development typically includes the following stages:



1. **Requirements Gathering:**

   This stage involves understanding the needs and requirements of the users and stakeholders. It includes activities such as user research, interviews, and observations to gather information about user preferences, goals, and tasks.
2. **Design:**

   In this stage, the design team creates the user interface and interaction design based on the gathered requirements. It includes creating wireframes, prototypes, and visual designs to define the structure, layout, and functionality of the software.
3. **Implementation:**

   The design is then translated into actual code during the implementation stage. The development team writes the software code, integrates different components, and ensures that the software functions as intended.
4. **Integration and Testing:**

   Once the individual components are implemented, they are integrated into a cohesive system. Testing is performed to ensure that the software behaves correctly, meets the requirements, and provides a satisfactory user experience. This stage may also involve acceptance testing with the customers to ensure that the system meets their needs.
5. **Maintenance:**

   After the software is released, it enters the maintenance stage. This stage involves ongoing support, bug fixes, updates, and enhancements based on user feedback and changing requirements. Maintenance continues until a new version of the software is released or the product is phased out.

It is important to note that the software life cycle in HCI software development is iterative and never complete. The design process involves continuous refinement and improvement based on user feedback and evaluation.

3.b) Explain in detail the interaction design process.
Ans.3.b)

4.a) Enumerate Norman's seven principles for transferring difficult task to simple one in design?
Ans.4.a)

4.b) Explain about the various factors distinguishing evaluation techniques.
Ans.4.b)

5.a) Explain in detail about cognitive model and its techniques.
Ans.5.a)

5.b) Explain in detail about the various socio-technical models?
Ans.5.b)

6.a) Explain in detail about communication and collaboration models.
Ans.6.a)

6.b) Discuss about Linguistic Models.
Ans.6.b)

7.a) With neat diagram of mobile ecosystem, discuss its platforms and application frameworks.
Ans.7.a)

7.b) Describe the following:
- **a. Mobile Ecosystem**
- **b. Platforms**

Ans.7.b)

8.a) a) Explain the various mobile information architecture.
Ans.8.a)

8.b) List and explain the elements of mobile design.
Ans.8.b)

9.a) Discuss in detail the purpose of drag and drop.
Ans.9.a)

9.b) Explain the steps involved in designing a web interface.
Ans.9.b)

10.a) Discuss in detail the various types of selection patterns.
Ans.10.a)

10.b) Explain in detail the various ways to reveal contextual tools.
Ans.10.b)