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PAPER: HUMAN COMPUTER INTERACTION

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Question No: 1 part(a)

What is the main aim of the Don Norman's Book (The Design of Everyday things)?

Answer:

The main aim of the Don Norman's Book (The Design of Everyday things)

Donald Norman about how design serves as the communication between object and user, and how to optimize that conduit of communication in order to make the experience of using the object pleasurable.

Part b:

Explain Deductive and Abductive reasoning with examples.

Answer:

Deductive Reasoning

Deduction is generally defined as "the deriving of a conclusion by reasoning." Its specific meaning in logic is "inference in which the conclusion about particulars follows necessarily from general or universal premises." Simply put, deduction—or the process of deducing is the formation of a conclusion based on generally accepted statements or facts.

Example 1.

It occurs when you are planning out trips, for instance. Say you have a 10 o'clock appointment with the dentist and you know that it takes 30 minutes to drive from your house to the dentist's. From those two facts, you deduce that you will have to leave your house at 9:30, at the latest, to be at the dentist's on time.

Example2.

Deductive reasoning always follows necessarily from general or universal premises. If a sandwich is defined as "two or more slices of bread or a split roll having a filling in between," and a hot dog is defined as "a frankfurter; especially : a frankfurter heated and served in a long split roll" then one must deduce that any hot dog served in a split roll is a sandwich.

Example3. If it is Friday then he will go to work

It is Friday

Therefore, he will go to work

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Abductive Reasoning

Abduction, is defined as "a syllogism in which the major premise is evident but the minor premise and therefore the conclusion only probable." Basically, it involves forming a conclusion from the information that is known.
Example of abduction is a detective's identification of a criminal by piecing together evidence at a crime scene.

Reasoning from event to cause

Example: Sam drives fast when drunk.

If I see Sam driving fast, assume drunk.

Logical conclusion not necessarily true:

Example: Ground is wet, if it is raining.

Ground is wet

So, it is raining.

Q2:
Analyze the following scenario and write down seven stages of action for given particular scenario for solution.
Scenario is:
Suppose I want to go to University, but the tyre of my car got punctured. Now I have to repair it.
You are required to write the seven stages of Gulf of Execution and Evaluation to solve the scenario.

Answer:

Seven Stages of Action

Seven Stages of Action constitute four stages of execution, three stages of evaluation and our goals.

1. Forming the goal
2. Forming the intention
3. Specifying an action
4. Executing the action
5. Perceiving the state of the world
6. Interpreting the state of the world
7. Evaluating the outcome

Scenario Solution:

Stage 1 is Forming a Goal. This is what you want. As a Scenario, I want to go to University, but the tyre of my car got punctured. Now I have to repair it.

Stage 2 is Forming the Intention. This is what would satisfy the goal. A repaired car would satisfy my goal of reaching the University.

Stage 3 is Specifying an Action. What do I have to do to achieve the intention? I would need to repair a car to meet the requirement set in my goal.

Stage 4 is Executing the Action. Here I would do the steps of the action. I would repair the car.

Stage 5 is Perceiving the State of the World. Using the senses to gather information. My repaired car would be able to move to the University.

Stage 6 is Interpreting the State of the World. What has changed? Punctured tyre of my car has been changed and it can move now.

Stage 7 is Evaluating the Outcome. Did I achieve my goal? I can move towards University now without worrying. I achieved my goal.

Q3:

a) Differentiate slip and mistake.

Slip: *Slips* are errors in carrying out an intended method for reaching an objective

Mistake:

Mistakes are errors in choosing an objective or specifying a method of achieving it.

For example

The division occurs at the level of the intention: A Person establishes an intention to act. If the intention is not appropriate, this is a *mistake*. If the action is not what was intended, this is a *slip*.

Differentiation:

Slips:

- right intention, but failed to do it right
- causes: poor physical skill, in attention etc. (catching a ball)
- change to aspect of skilled behaviour can cause slip (You were needed skilfully)

Mistakes:

- wrong intention from very start.
- cause: incorrect understanding
- humans create mental models to explain behaviour.
- if wrong (different from actual system) errors can occ**ur**

Part b:

Explain self-perception and object perception.

Answer:

Self-Perception: Self-perception theory is an account of attitude formation developed by psychologist Daryl Bem. It asserts that people develop their attitudes by observing their own behavior and concluding what attitudes must have caused it. The theory is counterintuitive in nature, as the conventional wisdom is that attitudes determine behaviors. Furthermore, the theory suggests that people induce attitudes without accessing internal cognition and mood states. The person interprets their own overt behaviors rationally in the same way they attempt to explain others' behavior.

Object Perception: Object perception does accord with principles governing the motions of material bodies: Infants divide perceptual arrays into units that move as connected wholes, that move separately from one another, that tend to maintain their size and shape over motion, and that tend to act upon each other only on contact.

Q4:

Write the steps involved in perceptual process.

Answer: **Perceptual process**

The perceptual process is a sequence of steps that begins with the environment and leads to our perception of a stimulus and an action in response to the stimulus. This process is continual, but you do not spend a great deal of time thinking about the actual process that occurs when you perceive the many stimuli that surround you at any given moment.

The steps involved in Perceptual process

- The Environmental Stimulus
- The Attended Stimulus
- The Image on the Retina
- Transduction
- Neural Processing
- Perception
- Recognition

- Action

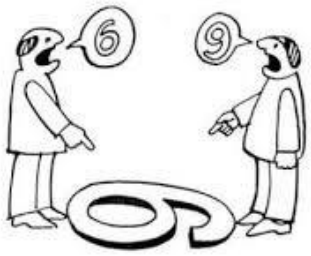
Part b: Differentiate between perception and recognition.

Answer:

Perception: Perception is the organization, identification, and interpretation of sensory information in order to represent and understand the presented information or environment. All perception involves signals that go through the nervous system, which in turn result from physical or chemical stimulation of the sensory system.

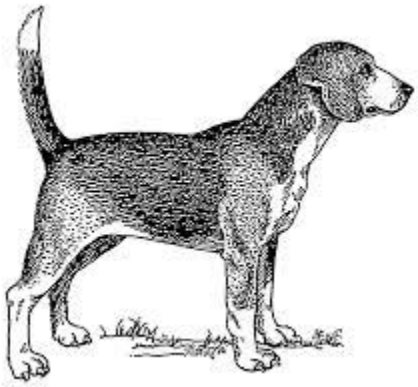
images are perceived by humans, therefore it varies from human to human

e.g.



Recognition: Award, something given in recognition of an achievement.

e.g. a dog present in an image can be recognized as a dog only.



Q5:

a) **A graphic designer, wants to design a 3d shape using Adobe Illustrator, he selects a shape, apply some gradient on it and then apply drop shadow effect.**
In the given scenario in the light of interaction identify the Goal, Problem domain and the task.

Answer: In the light of interaction:

1. **Identify the Goal: Wants to design a 3D shape using illustrator.**
2. **Problem Domain:** A **problem domain** is the area of expertise or application that needs to be examined to solve a problem. problem domain is simply looking at only the topics of an individual's interest, and excluding everything else.

   In this case the problem domain design a 3D shape

3. **Task: To complete the design of 3D shape.**

Part b:

Explain Gulf of Execution and Gulf of Evaluation?

Answer: Gulf of Execution

In human computer interaction, the Gulf of execution is the gap between a user's goal for action and the means to execute that goal. Usability has as one of its primary goals to reduce this gap by removing roadblocks and steps that cause extra thinking and actions that distract the user's attention from the task intended, thereby preventing the flow of his or her work, and decreasing the chance of successful completion of the task. Similarly, there is a gulf of evaluation that applies to the gap between an external stimulus and the time a person understands what it means.

Gulf of Evaluation

In computer science, the gulf of evaluation is the degree to which the system or artifact provides representations that can be directly perceived and interpreted in terms of the expectations and intentions of the user. Or put differently, the gulf of evaluation is the difficulty of assessing the state of the system and how well the artifact supports the discovery and interpretation of that state. According to Donald Norman's The Design of Everyday Things "The gulf is small when the system provides information about its state in a form that is easy to get, is easy to interpret, and matches the way the person thinks of the system.