KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATIONS, 2024/2025 ACADEMIC YEAR
FIRST YEAR, FIRST SEMESTER EXAMINATION
FOR THE DIPLOMA IN SOFTWARE ENGINEERING

DSE 1011: HUMAN COMPUTER INTERACTION AND DESIGN

DATE:5TH DECEMBER 2024
TIME: 2:30 PM-4:30PM

INSTRUCTIONS TO CANDIDATES
ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE: COMPULSORY (30 MARKS)

a) Psychologist and cognitive scientist Donald A. Norman published a book titled The Psychology of Everyday-things. In it he reviews the factors that affect our ability to use the items we encounter in our everyday lives which is based on different types of knowledge and how we gain this knowledge. Differentiate between knowledge in the world and knowledge in the head according to Donald Norman citing relevant examples where possible for each case. **[2 Marks]**

b) The constructivist and ecological theorists fundamentally disagree on the nature of perception. Yet, interface and web designers should recognize that both theories can be useful in the design of interfaces. Discuss the terms "affordance" and "visibility" as used in usability principle. **[2 Marks]**

c) Perception is the way humans perceive visual information it is especially important in the design of visual displays in computer systems, discuss the two theories that supports perception **[6 Marks]**

d) State and explain any **THREE** mistakes one should avoid when designing user interfaces. **[3 Marks]**

e) State and explain any **THREE** factors you would consider when designing the interface layout for a web page application? **[3 Marks]**

f) Discuss the various approaches of focusing users' attention in the design of user interfaces. **[4 Marks]**

g) Explain the difference between usability and user experience (UX) **[2 Marks]**

h) Briefly discuss the relationship between HCI and other fields like psychology and design **[4 Marks]**

i) Briefly discuss any **FOUR** key issues of data gathering? **[4 Marks]**

QUESTION TWO: (20 MARKS)

a) Briefly describe four benefits that task analysis can offer to the design of interactive computer systems. **[4 Marks]**

b) To assess the interaction between human and computers, Donald Norman in 1988 proposed seven principles that can be used to transform difficult tasks, discuss them **[7 Marks]**

c) Explain any **TWO** styles of interaction between human and a computer system stating an advantage and disadvantage for each. **[4 Marks]**

d) Consider the following statement: "a digital camera is both an input and output device" Discuss whether this statement is true or false **[2 Marks]**

e) Discuss any **THREE** ethical considerations in designing AI-powered systems **[3 Marks]**

QUESTION THREE (20 MARKS)

a) Good use of color is powerful in any application, but particularly important in web pages. Poor color choices significantly reduce usability of GUI applications or websites since it affects readability and recognition. State and explain guidelines for using color at the interface. **[2 Marks]**

b) Discuss **THREE** factors that need to be considered when analyzing a human computer interaction problem. **[6 Marks]**

c) Explain any **TWO** types of interaction style and provide an example. **[4 Marks]**

d) Differentiate between Affordance and attention as used in human computer interaction. **[4 Marks]**

e) What are some of the challenges in incorporating user feedback in the HCI design process. **[4 Marks]**

QUESTION FOUR (20 MARKS)

a) Outline four professionals who could work together to create a good user interface. **[4 Marks]**

b) Many users of system prefer to select options rather than type the information.

    i. Outline **THREE** reasons that could have led to this preference. **[3 Marks]**

    ii. Explain **TWO** limitations of such a system. **[4 Marks]**

c) Differentiate between perception and representation as used in human computer interaction. **[4 Marks]**

d) With the aid of a well labeled diagram, illustrate the Don Norman's model of interaction. **[5 Marks]**

QUESTION FIVE (20 MARKS)

a) Briefly explain **THREE** interaction styles in software's. **[3 Marks]**

b) By discovering what users know about systems and how they reason about how the systems function, it may be possible to predict learning time, likely errors and the relative ease with which users can perform their tasks. We can also design interfaces which support the acquisition of appropriate user mental models. Gestalt' s principles of interface design emphasize that the way items are grouped determines how users understand them. Briefly discuss the various Gestalt principles: **[6 Marks]**

c) Explain **TWO** advantages in using a GUI rather than a command line interface. **[2 Marks]**

d) Discuss the **THREE** most important features of a graphical user interface that makes is usable by system users **[3 Marks]**

e) When using prototyping, the developer builds a simplified version of the proposed system and presents it to the customer for consideration as part of the development process. The customer in turn provides feedback to the developer, who goes back to refine the system requirements to incorporate the additional information. Discuss various benefits that prototyping provides to user interface design. **[4 Marks]**

f) Explain the connectionist approach as used in cognition. **[2 Marks]**