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**UNIVERSITY EXAMINATIONS
2022/2023 ACADEMIC YEAR**

**END OF SEMESTER EXAMINATIONS
YEAR THREE SEMESTER TWO EXAMINATIONS
FOR THE DEGREE OF BACHELORS OF SCIENCE
(INFORMATION TECHNOLOGY)**

COURSE CODE: BIT 324
COURSE TITLE: HUMAN COMPUTER INTERACTION

DATE: 28/04/2023 **TIME: 09.00 A.M.-11.00 A.M.** **2HRS**

INSTRUCTIONS TO CANDIDATES
ANSWER QUESTION ONE AND ANY OTHER TWO (2) QUESTIONS

QUESTION ONE (COMPULSORY) [30 MARKS]

- a) Define Human Computer Interaction [2 marks]
- b) Discuss the four parts of an interaction framework [4 marks]
- c) What is the difference between Mapping and affordance as explained by Don Norman [2 mark]
- d) Information is received and responses given via a number of input and output channels: discuss the following types of channels
- i. Visual channel [1 mark]
 - ii. Auditory channel [1 mark]
 - iii. Haptic channel [1 mark]
- e) Explain the two ways to achieve dialog initiative. [2 marks]
- f) There are many factors that interact with each other in HCI, making the analysis and the design of any system complex. Explain at least four factors [4 marks]
- g) State the six principles that will ensure a design is user centered [3 marks]
- h) Illustrate the function of Graphical User Interface [1 mark]
- i) What are we likely to see in future Human- Computer Interfaces? [3 marks]
- j) Distance is an interface that decides the gulfs between a user's goal and the level of explanation delivered by the systems with which the user deals. These are referred to as the Gulf of Execution and the Gulf of Evaluation, discuss the Gulf of Execution and the Gulf of Evaluation [2 marks]
- k) Explain the meaning of the following concepts as used in UID.
- i. Cognitive models [1 mark]
 - ii. Participatory Design [1 mark]
 - iii. Task Analysis [1 mark]
 - iv. Anthropomorphic Approach [1 mark]

QUESTION TWO [20 MARKS]

- a) Flexibility refers to the diversity of ways in which the user and the system exchange information. This can be achieved through categorized ways, Illustrate the difference between Substitutivity and Customizability as used in flexibility. [4 marks]

- b) Designing the User Interface by Ben Shneiderman Proposed eight golden rules that are derived heuristically from experience and applicable in most interactive systems after being properly refined, extended and interpreted. Discuss the eight golden rules. **[16 marks]**

QUESTION THREE [20 MARKS]

- a) State the three principles for user-centered approach. **[2 marks]**
- b) Learnability revolves around the features of an interactive system that allow novice users to understand how to use it at first and then how to attain a maximal level of performance Discuss Familiarity and Generalization as used in Learnability. **[4 marks]**
- c) Illustrate the Seven Principles of Universal Design. **[14 marks]**

QUESTION FOUR [20 MARKS]

- a) There are many formalism techniques that we can use to signify dialogs. State three of these formalism techniques **[2 marks]**
- b) Robustness concerns itself with supporting the user in successfully accomplishing an action with the system and assessment of the action. There are various principles to be applied to support a system robustness: explain the following principles
- i. Observability **[2 marks]**
 - ii. Recoverability **[2 marks]**
- c) With the aid of a well labeled diagram the four distinct phases involved in User centered design. **[8 marks]**
- d) The ISO standard describes 6 key principles that will ensure a design is user centered discuss the six principles. **[6 marks]**

QUESTION FIVE [20 MARKS]

- a) Explain the following principles of robustness
- i. Responsiveness **[2 marks]**
 - ii. Task conformance **[2 marks]**

b) State and explain the six principles in the Design of everyday things by Don Norman. [12 marks]

c) Give the distinction between a process-oriented and a structure-oriented design rationale technique. [4 marks]