M.Sc. TE 3rd Semester 28 February 2020 (Afternoon)

# ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
## ORGANISATION OF ISLAMIC COOPERATION (OIC)
## Department of Computer Science and Engineering (CSE)

**MID SEMESTER EXAMINATION** **WINTER SEMESTER, 2019-2020**

**DURATION: 1 Hour 30 Minutes** **FULL MARKS: 75**

## CSE 6391: Advanced Human Computer Interaction

**Programmable calculators are not allowed. Do not write anything on the question paper.**

There are **3 (three)** questions. **Answer all of them**.

Figures in the right margin indicate marks.

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1. a) What are experiential and reflective cognitions? Explain with examples. 8

   b) Suppose you want to design a two-way communication tool between deaf/mute and normal people. Your goal is to design communication dialogues using noun-verb combinations for this communication aid. Nouns are the context information where the interaction takes place and verbs are the operations or actions the user wants/allowed to perform.

      i. Identify the technologies required to support this assistive communication aid and describe in brief. 9

      ii. Design the dialogue (containing nouns and verbs) for the conversations between deaf/mute and normal person. 8

2. a) Monocular cues allow people to see visual depth in the absence of binocular vision. List the monocular depth cues with one example of each cue. 8

   b) Consider the arrangement of image files in the 2D interface as given in Figure 1.


Figure 1: File manager in 2D

Answer the followings: 7

   i. Can visual depth affect the target detection task (selecting a particular image file) in the 2D interface? Explain. 10

   ii. Redesign the interface of Figure 1 by introducing monocular depth cues those are suitable to improve visual attention. You have to keep in mind the issues related to cognitive load while designing.

3. a) Interaction design can be considered as a translation problem between task language and system language. During these translations the gulfs that can be analyzed are Articulation, Performance, Presentation, and Observations. Categorize the following poor translations into these four type of gulfs with one sentence justification. 8

   i. Adjacent keys causing opposite state changes → Performance
   ii. To shutdown windows, the user must click on START → Articulation
   iii. Applications performing the commands wrong → Performance
   iv. Lack of indentation, no visual change in the UI → Presentation
   v. User cannot find important Windows OS commands → Articulation
   vi. Pressing keys simultaneously → Articulation
   vii. Cannot read fonts inside the image printed. → Observation
   viii. There is no indication that the file has been saved already by pressing `Ctrl+S` command. Presentation

   b) Suppose you are designing a Force Touch UI. Force Touch is a feature that was developed by Apple to sense the level of force exerted on a touchpad or trackpad and respond accordingly. People exert forces differently, based on gender, age, and physique.

      i. How would you develop a general scale to measure force touch input that could then be reliably used to trigger system responses? 7

      ii. Suggest some interactions that can be designed with this technology for a real-life scenario. 10