B.Sc. Engg. CSE 8th Semester **11 November 2020**
B.Sc. TE (2-Yr)
B.Sc. TE (1-Yr)

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)

Department of Computer Science and Engineering (CSE)

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

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

CSE 4849: Human-Computer Interaction

This is a closed book online written exam. Answer script in pdf should be uploaded in the Google classroom of this course. In case of uploading problem send to WhatsApp number 01844056187

Answer the following **3 (three)** questions.
Figures in the right margin indicate marks.

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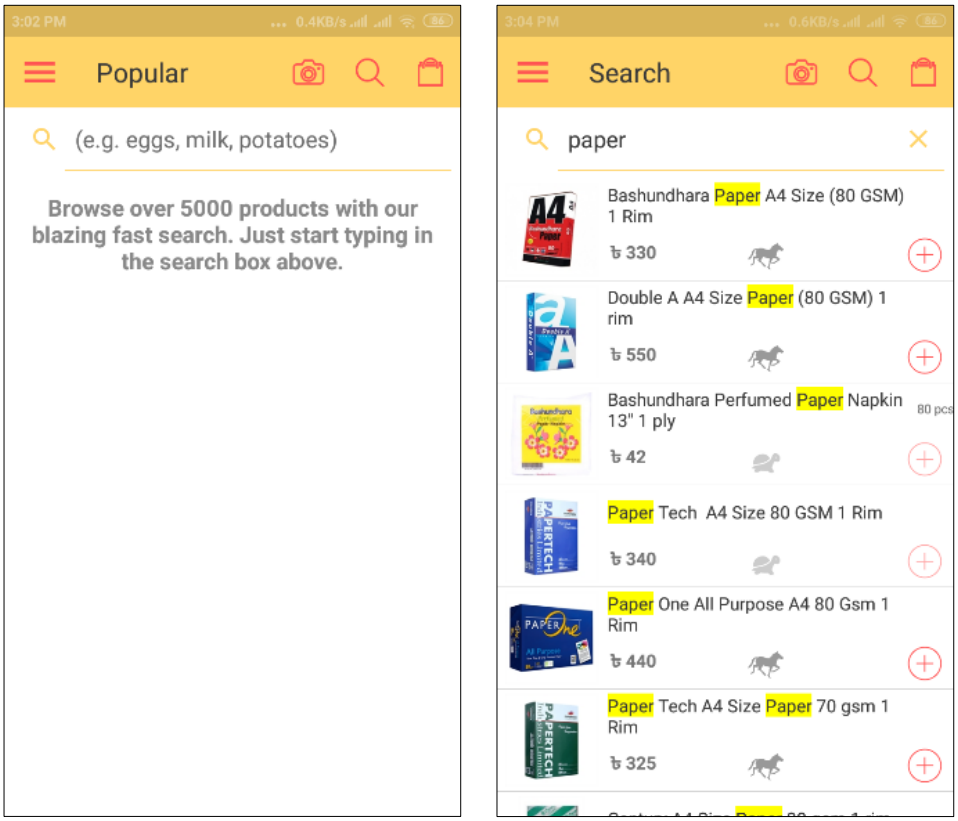
1. a) Due to the recent pandemic of COVID-19, we have already lost many lives. The Centers for Disease Control and Prevention (CDC) has already addressed an increase in adverse mental health conditions. Level of anxiety, depressive disorders if not monitored and treated adequately we may observe these patterns more arising. The toxic nature of many social media applications hampers wellbeing and productivity. Hence designing a mental health app requires a lot of studies that synthesize several aspects like, psychology, sociology, UX/UI issues, and so on. Based on the scenario answer the followings:
   i. Explain the interrelated aspects of Human-Computer Interaction (HCI) related to this mental health app for wellbeing. 15
   ii. Draw an HCI framework showing the aspects you considered appropriate for this application. 10

2. a) Suppose you have to design a computer vision-based system to recognize free-hand writing through index finger. While writing on air, a user can move his/her finger in 3D space and produce a sequence of patterns/features that need to be understood as a symbol like, ‘A’, ‘B’, ‘5’, ‘8’, etc. Answer the followings:
   i. How do we measure distance and understand our environment in 3D? 5
   ii. What are the depth cues do you think could be effectively utilized to extract important patterns/features to recognize the written symbols by a computer system? [Assume you have captured 2D gesturing images and the depth-map information of the gesturing hand provided by depth camera.] 12
   iii. If the gesturing images are 2D image sequence without depth-map information from depth camera then, how can you utilize different monocular cues to extract depth information? 8

3. a) Consider the searching task in the interfaces shown in Figure 1 (a) and 1 (b). You are given a choice to select two interaction styles for the task. One is writing a query string in the search box and another one is giving voice commands using natural language. You are asked to use the interaction model to analyze interaction problems involved for the task.
   Answer the followings:
   i. Describe different gulfs with examples in each stage of the interactions for these two styles of interaction and justify which interaction style will give a better user experience. 12
   ii. How can you assess the mappings of different translation languages through the interaction model for the searching task through the interfaces of Figure 1 (a) and 1 (b)? Explain. 13



(a) (b)

Figure 1: Search interfaces in a mobile application