

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

**Department of Computer Science and Engineering (CSE)**

**MID SEMESTER EXAMINATION**

**WINTER SEMESTER, 2018-2019**

**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 **4 (four)** questions. Answer any **3 (three)** of them.

Figures in the right margin indicate marks.

1. Humans are capable of retaining  $7 \pm 2$  items in the short-term memory. This phenomenon raises design implications to many user interface considering the design principle, '*Recognition is better than recall*'. Figure 1 (a), (b) shows Search box interfaces and Figure 1(c), (d) displays Order information from the mobile app version of 'chaldal.com'.

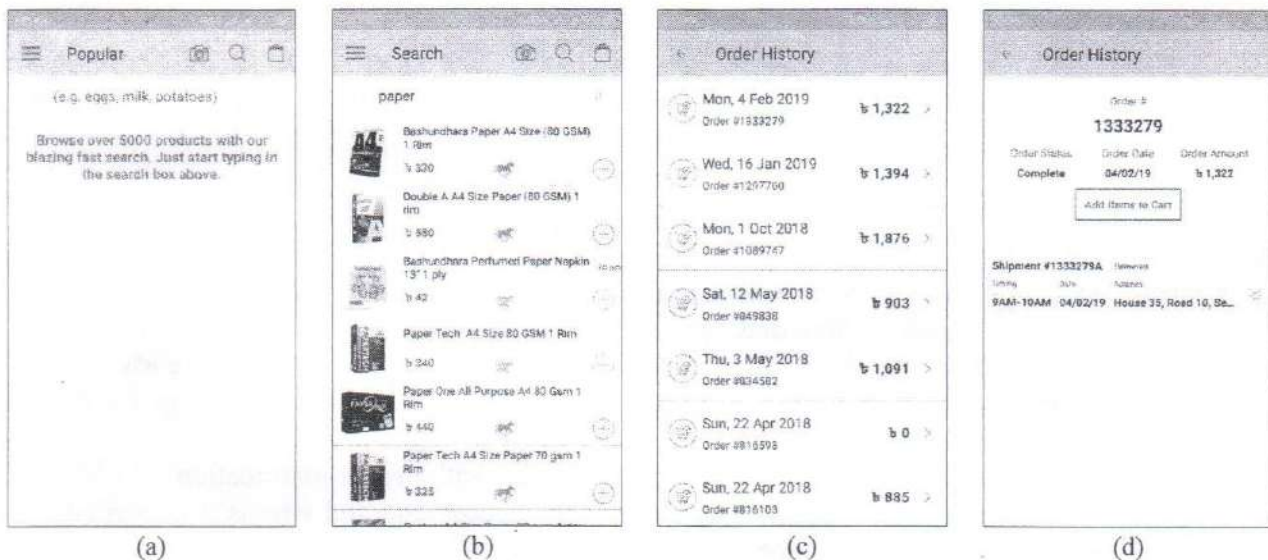


Figure 1: Interfaces from mobile app

- a) Are there enough visual cues here for the user to find the functionality or item? Explain your answer. 7
  - b) Do they have to remember things to understand what's going on? Justify your answer. 6
  - c) How can you help the user recall? Explain and redesign the interfaces by drawing hand sketches. 12
2. a) Suppose you want to design a text-based interaction where the font size will be changed according to the distance from a user to display screen. If the screen resolution is 120 dpi, distance is 20 inch, and the visual angle is 21 minutes then what will be the font size of the text? 8
- b) How does the 'Gulf of execution/Gulf of evaluation' design issues became relevant for designing VR-based application? 5

- c) Define Fitts' Law and how it applies to user interface design. Apply your knowledge of this law to Figure 2 below and indicate with reasons which target you think is fastest to reach with the mouse starting at location M. Assume that you can move your hand equally well in all directions, and that none of the targets are near a screen edge. Include all calculations in your answer. 4+8

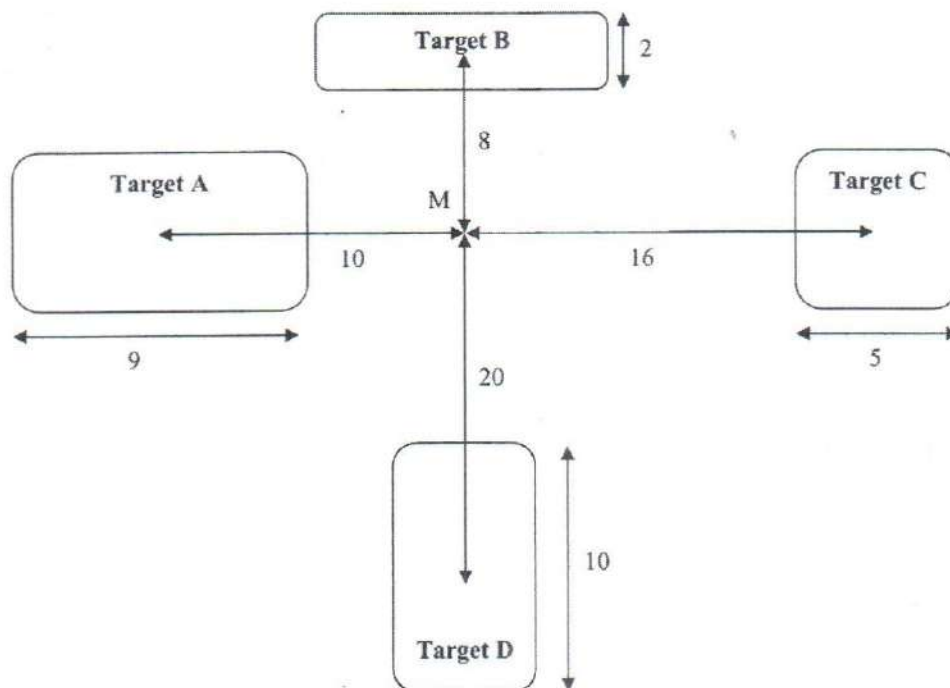


Figure 2: Fitts' law diagram

3. 'Prosopagnosia', also called face blindness, is a cognitive disorder of face perception in which the ability to recognize familiar faces, is impaired, while other aspects of visual processing (e.g., object discrimination) and intellectual functioning (e.g., decision-making) remain intact. You are asked to design a system to improve a prosopagnosia patient's daily life. Answer the followings for the problem described.
  - a) Which interaction styles are suitable for the system? Explain with proper justification. 9
  - b) What are the characteristics of input/output devices you recommend and why is it important? Provide adequate justifications/assumptions of your answer. 8
  - c) How could you analyze different interaction problems that may arise while performing interactions? 8
4. You are asked to design interaction dialogs using the right hand gesture. Deliberate pointing movement through finger can be considered as an input modality. Your design should utilize a set of gestures to control menu-driven interface. There are different types of menu such as selection menu, pop-up/pop-in menu, pull-down menu, pie menu, etc.
  - a) What are the design considerations for menu-driven interface? 8
  - b) Suggest a set of gesture-based interaction dialogue to control such menu-driven interface. 12
  - c) Comments on the usability issues if you merge mouse-pointer-based menu and gesture-based menu to support multimodality as input. 5