PART A: SHORT QUESTIONS **[10 Marks]**

Answer the following **5 statements** by first stating whether it is **correct or incorrect** and then followed by a **ONE-sentence motivation (reason)** of the answer.

1. The advantage of low-fidelity prototyping addresses screen layout issues while its disadvantage addresses inefficient for proof-of-concept designs.
2. Evaluation methods which include asking users and experts must be performed using both control and natural settings situation.
3. Usability testing may involve user satisfaction questionnaires and interviews to provide data about users' opinions and also compare of products or prototypes.
4. Fitts' Law is one of the most widely used techniques to evaluate system for a handheld and mobile devices which the time to locate an object is important.
5. The data analysis that can be done depends on the approach of the performed data gathering. Either qualitative or quantitative data may be gathered from any of the two data gathering approaches, including questionnaire and interview.

PART B: STRUCTURED QUESTIONS **[58 Marks]**

This part consists of FIVE (5) structured questions. The mark for each part of the question is as indicated.

Question 1: **[24 Marks]**

Read the following scenario.

(The setting is in a university accommodation college sometime in the future)
Ali would like to book a ticket back to his hometown in Kota Bharu for the upcoming semester break through an online system. This is the first time Ali using the online bus ticketing system. His travel will be from Johor Bahru to Kota Bharu. Ali would like to choose the cheapest option by changing the settings such as date and seat type. There are usually more than 20 choices of bus companies, seats, and travel time. Ali only wishes to see and filter selection of buses travelling after 8.00pm from Johor Bahru for this journey. Once Ali select his preferred route, Ali wish to share his travel information with his friends so that they can travel together.

a. By using the above scenario, propose a **Hierarchical Task Analysis (HTA)** to buy an online ticket from a bus ticketing system. The HTA should at least involve elements of Goal, Task, and Actions. [14 marks]
b. Draw a mobile application interface to support ALL tasks as described in the scenario (emphasise the use of consistent metaphor in the mobile application interfaces). [10 marks]

Question 2: **[16 Marks]**

Read the following description.

Splendid Hotels' have been in the accommodation business for approximately five years. In 2002, they launched their first website which comprised a very basic interface for advertising their rooms and services. Last year, a new online room booking facility was built into their website in hope to alleviate bookings made via their phone service. Since launching this new service, annual reports revealed that customers continued to make bookings via phone and have not taken up in using the online booking service. Management investigated this issue and

discovered that customers preferred to book via phone because the website was too confusing and difficult for them to use. Consequently, Splendid Hotels have sought to hire your team as a usability consultant to re-design their Online Bookings screen to make it more 'user-friendly' and evaluate the prototype design.

a. What is the goal of an evaluation? [2 marks]
b. Describe THREE (3) types of evaluation setting environment by giving each an example. [6 marks]
c. Create a usability test plan (step-by-step) that describes how you would conduct a *usability testing* of the prototype design for the new Online Room Booking? [6 marks]
d. Describe ONE (1) example of parameter in measuring efficiency for the task of Online Room Booking facility. [2 marks]

Question 3: **[10 Marks]**

One of the most widely used performance model in HCI is Fitts' law. Figure 1 shows Adobe Photoshop drawing tool on a standard desktop computer. Users select the tool by clicking on one of the icons in the palette. The Fitts' formula for Movement Time (MT), is given as:

$$\mathbf{MT = a + b \log2 (A/W+1)}$$

a. Suggest how you can redesign the user interface of Adobe Photoshop drawing tools based on the reduction of the MT variable value? [3 marks]
b. Discuss how the Fitts' law can be used to predict performance. [3 marks]
c. Most of the menus we see in Windows and Mac platforms use drop down menu. By using Fitts' Law, argue why pie menu is theoretically more efficient than drop down menu. [4 marks]

Figure 1. Adobe Photoshop drawing tool

Question 4: **[15 marks]**

Figure 2 (refer page 5) shows the Natural History Museum website. Based on Figure 2, answer the following questions.

a. List down FIVE (5) heuristic evaluation that you have learned in class. [5 marks]

b. Identify and explain THREE (3) examples of Nielsen's usability heuristic found in Figure 2. [6 marks]

c. Explain TWO (2) examples how the Gestalt Principles are used to group things in Figure 2. [4 marks]

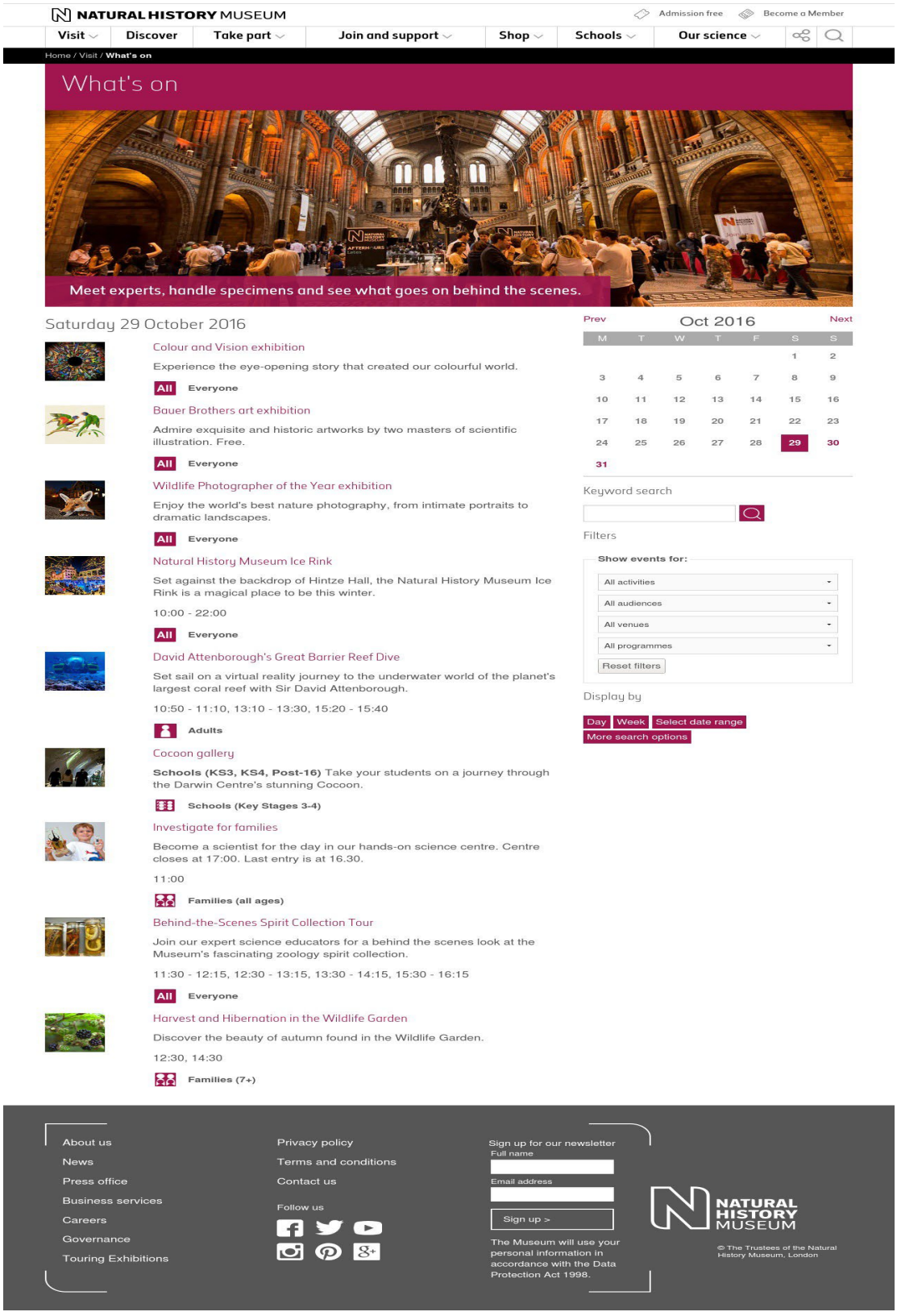

Figure 2. Natural History Museum website

PART C: LONG QUESTION **[25 Marks]**

This part consists of ONE (1) long question. The mark for each part of the question is as indicated.

Cardiothoracic unit at hospitals is a unit specialises in heart. One of the phases at cardiothorocic unit is patients are being warded at CICU and ICU. In this setting, patients are strictly monitored. Nurses take shift to monitor the patients by transcribing the data from the machine located next to patient's bed onto an observation chart (A3-size paper) that lay flat on the nurse's table from time to time (see Figure 3). The nurse plotted vital signs on it regularly, recorded blood test results, wrote other medical notes, and kept nonmedical care information on the reverse side. A new chart was used each day and was placed on top of the old one.

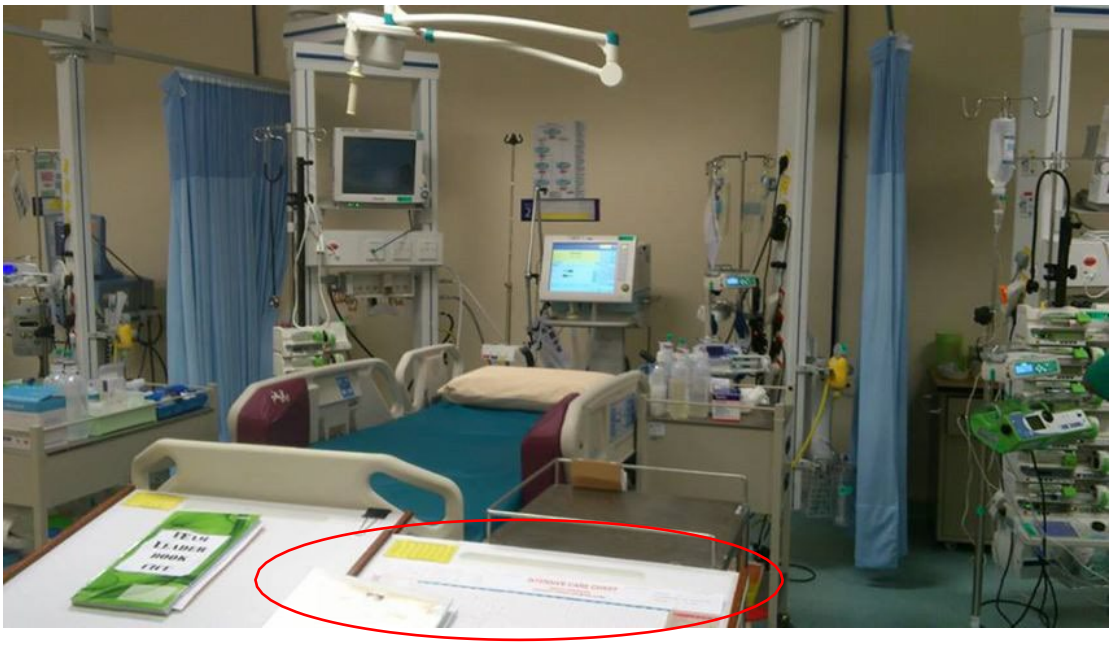

Figure 3: CICU setting with nurse's table (in circle) at the bottom left hand corner

When the time for the surgeons to make their rounds, they will refer to the charts and give their expert decisions on the patient, on amount of dosage to be given, type of dosage to be added or stopped, etc. In the condition of the patient is not normal, the nurses had to report instantly to the surgeons. But sometimes, the surgeons are unreachable and can't attend to the patient at that point of time. Due to this reason, the nurses normally use the current technology such as WhatsApp or any kind of social media communication to capture the patient's records to the surgeon, with the hope to get a quick response of call of action by the surgeons.

The disadvantages of this is, the doctors are limited in accessing the information where they can only 'view' the few seconds of the recorded streaming data from the machine, and/or, a snapshot of the chart.

As a HCI student, you are asked to participate in the design team to help and facilitate the surgeons and the nurses at the CICU cardiothoracic unit to make it more effective. However, the design team is still undecided on determining what would be the most suitable type(s) of interaction and interface to support the activities.

Having done a bit of a background reading on interaction and interface types, and starting to understand the setting at the CICU, you would like to make some recommendations. By focusing on only TWO problems or challenges in hand,

a. Identify and describe these TWO problems or challenges [4 marks]
b. Carefully explain and discuss ONE chosen interaction types for each problem [4 marks]
c. Justify TWO chosen interface types related to each problem [4 marks]
d. Narrate how both interaction and interface of your chosen types can support and overcome the current problems in the form of scenario [6 marks]
e. Based on your answer in (d), choose one scenario and illustrate it using a storyboard [7 marks]

* you may present the answers by problem, i.e. Problem #1 (a-d), Problem #2 (a-d), and followed by your answer for e.

[[Ends]]