WOMEN'S UNIVERSITY IN AFRICA

Addressing gender disparity and fostering equity in University Education

FACULTY OF MANAGEMENT AND ENTREPRENEURIAL SCIENCES

BSc HONOURS DEGREE IN COMPUTER SCIENCE

MAIN PAPER

HCS323: HUMAN COMPUTER INTERACTION

INTAKE 1: THIRD YEAR SECOND SEMESTER

TIME: 2 HOURS MORNING

INSTRUCTIONS TO CANDIDATES

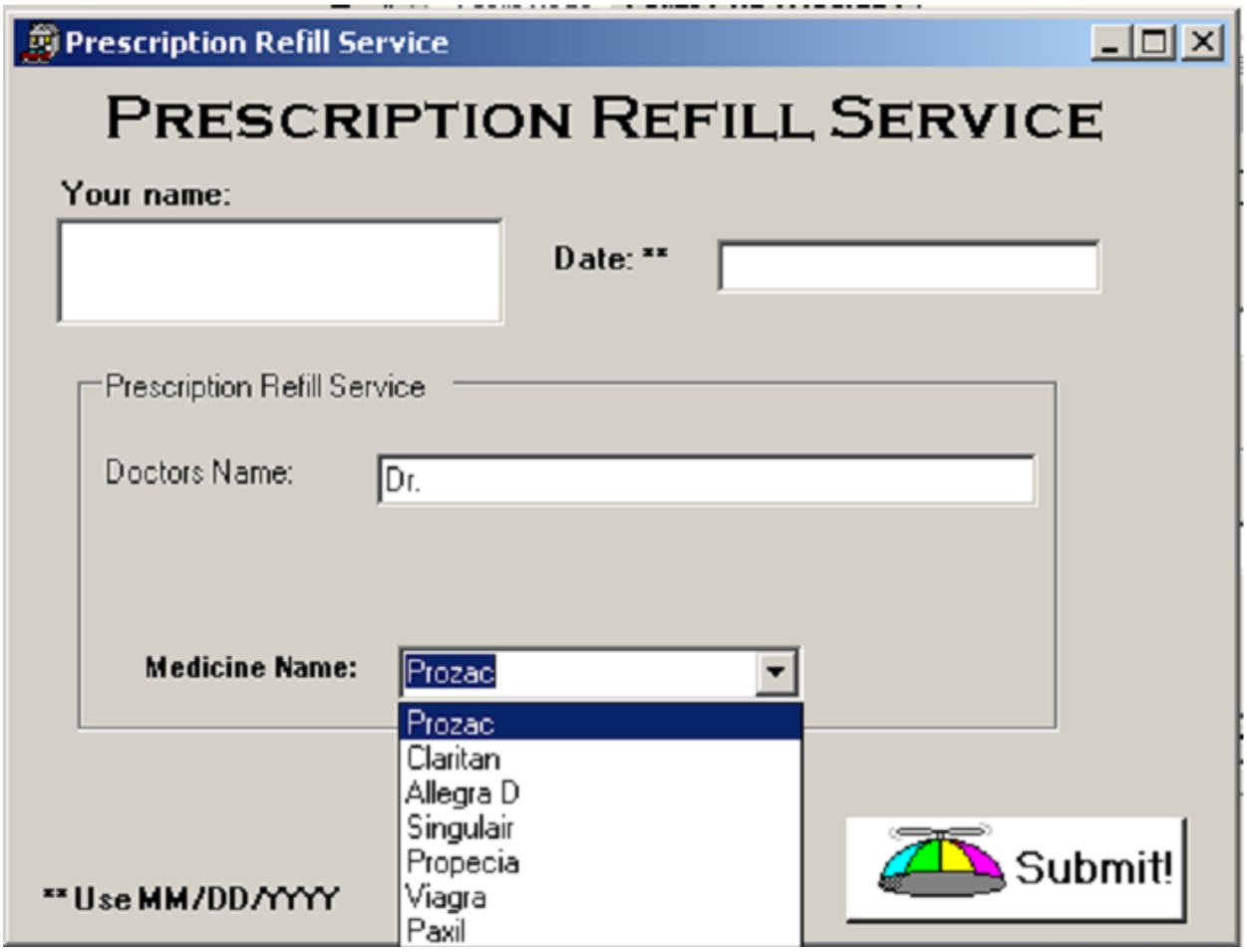
Answer any **four** questions.

Question 1

a) What are mental models, and why are they important in interface design? **[5]**

b) What can a system designer do to minimise the memory load of the user? **[6]**

c) Examine the following interface and describe five things which are wrong with it. **[10]**



d) What is the difference between a slip and a conceptual error? How might a designer minimise the occurrence of both among users of a system? **[4]**

Question 2

a) Describe (in words as well as graphically) the interaction framework introduced in Human Computer Interaction. Explain how it can be used to explain problems in the dialogue between a user and a computer. **[8]**

b) Describe briefly four different interaction styles used to accommodate the dialog between user and computer. **[8]**

c) Explain why the implementation of groupware is more difficult than that of single user applications. **[9]**

Question 3

a) Create a GOMS description of the task of photocopying a paper from a journal. Discuss the issue of closure in terms of your GOMS description. **[10]**

b) Choose an appropriate evaluation method for each of the following situations. In each case identify: the participants, the technique used, representative tasks to be examined, measurements that would be appropriate, and outline plan for carrying out the evaluation.

   i. You are at an early stage in the design of a spreadsheet package and you wish to test what type of icons will be easiest to learn. **[5]**

   ii. You have a prototype for a theatre booking system to be used by potential theatre-goers to reduce queues at the box office. **[5]**

c) Briefly introduce the field of study of ergonomics and specify its relation to HCI. **[5]**

Question 4

a) You have been asked to design an application for the next generation of mobile phones. The precise technology is yet to be decided upon. The aim of the system is to enable users to book tickets for sports events and for concerts using their phone. Explain how you would go about designing the interface to this system and how you would conduct formative evaluation during the initial stages of development *(Hint: you do not need to design the interface itself, simply describe the techniques you would use during the early stages of development).*

[12]

b) Give two reasons why expert users may not prove to be a good source of information about the requirements for an interactive system. **[4]**

c) How might sighted users also benefit if designers consider the needs of blind users in the development of a web site. **[5]**

d) Explain universal design **[4]**

Question 5

a) Provide a usability specification for an electronic meetings diary or calendar. First identify some of the tasks that would be performed by a user trying to keep track of future meetings, and then complete the usability specification assuming that the electronic system will be replacing a paper-based system. **[7]**

b) Describe why metaphors are used in GUIs? **[5]**

c) Give three examples of metaphors used in an operating system such as Windows® or macOS™. **[3]**

d) Give TWO examples of how colours are used as metaphors in GUIs. **[2]**

e) Virtual reality has found a number of applications in the games market. Is this a suitable use of such technology? Discuss the possible benefits and disadvantages of exploiting leading edge technology in a leisure market. **[8]**

Question 6

a) Task Analysis is an important component of user interface design and a number of methods, tools and techniques have been developed over the past 20 years. What are the main characteristics of Hierarchical Task Analysis? **[8]**

b) Provide a Hierarchical Task Analysis diagram for the simple task of making a cup of tea? **[9]**

c) Hierarchical Task Analysis is obviously based on hierarchies that are considered clear and easy to understand. However, the web and many user interfaces have a non-linear, hyper textual or star structure that is thought natural to users. Explain why users find star structures easy to use **[8]**

END