University of Swaziland

Department of Computer Science

Final Examination

2017/18

Title of Paper: Software Engineering II

Course Number: CS452

Time Allowed: Three (3) hours

*Instructions: Answer **ALL** questions*

Question 1

a) Name and discuss any three (3) interaction styles you have been exposed to. Your discussion should include the advantages of each. [9]

b) Draw an OOA diagram for the story below. [16]

MBABANE ZOO

The keepers in an animal park look after the feeding of the animals. Each animal is located in a different area of the park. Each area has its own keeper who reports to the head keeper.

The head-keeper maintains a record of the sorts of food that each animal species or type in the park should be fed, and in what quantities. There is no distinction made between different animals of the same species. The keepers access the information so they know what to feed each animal type. Each animal type may be given more than one type of food, and each type of food may be fed to a number of animal types. Each day the keepers will take out the food needed for the animals in their care and record this on the information system. These food types can be perishable or non-perishable according to their shelf life. For example, fresh fruit and vegetables would be perishable where tinned produce or cereals would be considered to be non-perishable.

The office staff keep a track of the food supplies. They monitor which foods are running low every two or three days and draw up a list of that which needs to be ordered. In order to help them, the information system contains details about re-order quantities and re-order levels. Sometimes they may need to readjust their re-order levels.

A number of suppliers are used, and their names, addresses and telephone numbers are kept in the system. Because of the large quantities required and the difficulty of obtaining some foods at certain times of the year, there is more than one possible supplier for each type of food. Most of the ordering is done via the telephone. A standard order form is then created. The order form usually contains details of more than one food type to be ordered from a particular supplier. The order also contains details of the date of the order and what quantities are required for each food type.

When deliveries are received, the keepers check the delivery note against the goods received, amend it if necessary and pass it on to the office. Here it is

checked against the orders placed. It they agree, this is recorded in the system. The office staff check the received orders against an invoice sent by the supplier. If they agree, payment is be made. Any discrepancies are taken up with the supplier, and the supplier's response is noted in the system. Most suppliers send an invoice each month.

Question 2

a) The testing process can produce several artifacts. Name and discuss any five (5) of them.   [15]

b) Compare and contrast box testing approaches you have been exposed to.   [10]

Question 3

a) In UML, what are use case diagrams used for?   [3]

b) Name the components that make up a use case diagram.   [3]

c) Draw a use case diagram for the story below.   [9]

MATSAPHA SURGERY

A doctors' surgery consists of five doctors a receptionist and a manager. They need an information system to help them to run the facility.

A patient may ring the surgery to make an appointment with a doctor. Each patient nominally has a doctor associated with him or her but they may often opt to see any doctor in the surgery that is available. The receptionist sees which doctors are on duty on which days and offers appointment alternatives from which the patient may choose. If an appointment is not available within a short time and the patient must be seen quickly they are asked to attend an emergency surgery that takes place every evening between 5 and 6 p.m. The appointment can be 5, 10 or 20 minutes long, dependent on the reported reason for seeing the doctor. This reason is recorded on the system. Sometimes patients ring to cancel appointments. Appointments may be made for up to six weeks in advance. Appointments that are more than 3 weeks old are automatically deleted from the system. Some appointments are for a doctor to go and visit a patient at home when the patient cannot come to the surgery. Every day one of the doctors is available for home visits in the afternoon.

A record is kept of each patient and the treatments they have received for any ailments they may have had. Here are recorded many details such as allergies, details of which drugs patients have been administered in which quantities and when. Also relevant personal details of each patient are recorded. Typically the doctor who sees a patient will want access to this information before deciding on the relevant treatment to give. When the doctor prescribes treatment, details will be recorded in the patient's record.

Repeat prescriptions are automatically produced by the system and are available for collection at the surgery by the patient. At any time a doctor may suspend or cancel the prescriptions.

Patients may register with the surgery providing the number registered to each doctor is not above a certain maximum. Sometimes patients die or leave the area. In this case the patient is removed from the system and their details are archived. The manager is responsible for dealing with this aspect.

d) Describe a sequence diagram.   [5]

e) Draw a sequence diagram for paragraph 2 in the story above (Question 3(c)).
      [5]

Question 4

a) Compare and contrast cohesion and coupling.   [10]

b) Discuss one form of coupling that is necessary. Give an example.   [5]

c) Name and discuss forms of cohesion whose desirability is high and ones that are not desirable.   [10]

End!!!