

University of Swaziland

Department of Computer Science

Supplementary Examination

2009/10

Title of Paper: Software Engineering II

Course Number: CS452

Time Allowed: Three (3) hours

Instructions: 1) This paper has five (5) questions and each carries 25 marks.

*2) Section A is **COMPULSORY**.*

3) Answer any two (2) questions in Section B.

You are not allowed to open this paper until you have been told to do so by the invigilator.

SECTION A (COMPULSORY)

Question 1

a) Define the following:

- Logical Cohesion [4 marks]
- Sequential Cohesion [4 marks]
- Communicational Cohesion [4 marks]
- Procedural Cohesion [4 marks]
- Coincidental Cohesion [4 marks]

b) Name the five types of coupling. [5 marks]

Question 2

Manzini hospital x-ray management system.

Patients present X-ray request forms, obtained from their doctors, to the receptionist. The receptionist receives each form and produces an appointment card which is given to the patient. This card contains information such as patient particulars and the time and date on which the patient may come for the X-ray. The X-ray request forms are filed for later reference. The receptionist also keeps a diary of all the appointments.

When patients arrive for X-rays on the appointed date and time, they produce their appointment cards. A nurse checks the validity of the card and passes the appointment card to the clerk. The clerk generates an x-ray film-and-report request form for the filing section. The X-ray request form is retrieved from the its file and given to the radiographer. The X-ray film-and-report requests are placed in a temporary file for collection by the filing section.

On receipt of the X-ray request form, the radiographer takes the appropriate photographs (called films) and places them on a temporary file for collection by the filing section. Each appointment results in a set of films.

The filing clerks collect the X-ray film-and-report requests. A patient may have many X-ray films and reports, the new films are attached and placed on a temporary file for the attention of the radiologist who will make out a report for the appointment.

The radiologist examines all the X-ray films and reports which the patient has and produces a final report which is sent to the patients doctor. A copy of this report is also sent to the filing section. When the filing section receives this report all corresponding films and reports are returned to the permanent files.

- a) Using UML notation, draw a USE CASE diagram for the X-ray management system. [15 marks]
- b) Draw a sequence diagram for the scenario described in paragraph 2 of the description of the X-ray management system. [10 marks]

SECTION B

Question 3

Discuss the contribution of Object-Oriented software development in the following aspects of software development.

- a) Managing the software development process. [8 marks]
- b) Software maintenance. [8 marks]
- c) Improving the quality of the final software system. [9 marks]

Question 4

- a) Explain the importance of having a well-designed user interface. [7 marks]
- b) Define the following:
 - I. User Profiling [3 marks]
 - II. Task Profiling [3 marks]
 - III. Prototyping [4 marks]
- c) Discuss the advantages and disadvantages of the following types of user interfaces.
 - Command-based user interface. [4 marks]
 - Menu-based user interface. [4 marks]

Question 5

- a) Explain the importance of carrying out tests in each phase of the software development process. [5 marks]
- b) Briefly describe the role of the following testing technique, making particular references to the phase or scenarios where each technique might be most appropriate:
 - 1) Reading [3 marks]
 - 2) Walkthrough [3 marks]

3) Coverage-based testing [3 marks]

c) Explain the main difference between the following terms:

1) Functional Testing and Structural Testing [2 marks]

2) Unit testing and Integration Testing [2 marks]

3) Alpha Testing and Beta Testing [2 marks]

4) Static Testing and Dynamic Testing [2 marks]

5) Integration Testing and System Testing [3 marks]

End!!!