



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE

SCT 207 : OBJECT ORIENTED ANALYSIS AND DESIGN

DATE: THURSDAY 12TH APRIL 2012

TIME: 2.00 P.M. – 4.00 P.M.

INSTRUCTIONS

Answer Question One and any other TWO

QUESTION ONE

- a) Distinguish between the three different types of events using an example in each case.

[6 Marks]

- b) i) What is the purpose of object oriented Analysis?

- ii) Identify the steps it consists of and give a brief description of each step.

[7 Marks]

A university wishes to increase security in its car park. It has been decided to issue an identity card to all employees. The cards record the employee's name, department and identity number. A barrier, a card reader and a sensor are placed at the entrance of the car park. The driver inserts the numbered card into the card reader. The card reader checks the card number. If the number is valid, the reader sends a signal to raise the barrier and the vehicle can enter the car park. The sensor sends a signal to the barrier to lower when the vehicle has entered. There is a system at the exit with a barrier which is raised when a car wishes to leave the car park. When there are no spaces in the car park a sign at the entrance displays "Full" and is only switched off when a vehicle leaves. Special visitors' cards, which record a number and the current date, also permit access to the car park. Visitors' cards may be sent out in advance or collected from reception. All visitors' cards must be returned to the reception when the visitor leaves the site so that they can be deleted from the list of valid cards.

REQUIRED

- ii) Using the above information, generate a use case description or scenario for a use case called enter car park [8 Marks]
- c) Explain the main difference between collaboration and sequence diagrams. [4 Marks]
- d) Name and explain the four phases of the Rational Unified Process (RUP) [5 Marks]

QUESTION TWO

- a) Explain the importance of sequence diagrams in object oriented system development. [4 Marks]
- b) Assume that you have to develop a computer system for a university library. The library contains books and each book may have several copies. Only members of the library may borrow books. The system checks whether the potential borrower is a member of the library, and whether there is a reservation on the book. If both checks succeed the system records that the book is on loan. Otherwise it cancels the loan. A library member may ask to extend the loan of the book. The system then checks whether there is a reservation on the book. If so, the system refuses to extend the loan. Otherwise it records the extension of the loan.

Required

- Draw a sequence diagram that shows scenario of the use case Borrow copy of book in which the user is permitted to borrow the book, and the system records that the book is on loan [7 Marks]
- c) Using appropriate examples differentiate between object diagram and class diagram. [5 Marks]
 - d) State and explain the benefits of modelling. [4 Marks]

QUESTION THREE

Kenyatta University wants to implement a mobile system where student members can query or get information via their mobile phones. A student can query opening dates, closing dates, fee balances, exam results and any disciplinary issues involving them.

- a. List all the classes, attributes and methods that will comprise the system.

[10 Marks]

- b. Draw the UML class diagram showing the relationships between the classes

NB: explain any assumptions made.

[10 Marks]

QUESTION FOUR

- a) Explain the purpose of activity diagrams.

[4 Marks]

- b) State four Differences between activity diagrams and flow chart diagrams.

[4 Marks]

- c) In a car rental company, the following procedure holds: a customer chooses the type of car he or she wants negotiates the price and if an agreement is reached then issues the agreed money, photocopy of DL and ID card. He/she signs the rental form and a copy is handed back to him/her. The customer then inspects the car to ascertain that it is ok. Once satisfied, the customer drives off. When returning the car, the Company inspects it for any damages or scratches. If any, the company demands some form of compensation. Draw an activity diagram for this description.

[12 Marks]

QUESTION FIVE

- a) Explain the meaning of the following terms: Regression Testing, acceptance Testing, validation and verification.

[4 Marks]

- b) Explain how structured oriented system differs from object oriented systems.

[5 Marks]

- c) In a Hospital System, a new patient is registered and then waits to see the respective doctor. The doctor checks the patient and depending on the symptoms advises the patient to get tested in the lab. The results of the test are taken back to the doctor who then prescribes medicine which is obtainable from the Hospital's pharmacy.

- i) Briefly describe use case diagrams.

[4 Marks]

- ii) Draw a use case diagram for this description.

[7 Marks]

