MURANGA UNIVERSITY COLLEGE

(A constituent College of Jomo Kenyatta University of Agriculture & Technology)

MAIN CAMPUS

ORDINARY UNIVERSITY EXAMINATIONS

2014/2015 ACADEMIC YEAR

THIRD YEAR SECOND SEMESTER EXAMINATIONS

FOR THE DEGREE OF
BACHELOR OF BUSINESS INFORMATION TECHNOLOGY

COURSE CODE: HBT 2305

COURSE TITLE: OBJECT ORIENTED ANALYSIS AND DESIGN

DATE: 22ND APRIL 2015 **TIME:** 2.00 P.M. – 4.00 P.M.

INSTRUCTIONS TO CANDIDATES

Question ONE (1) is compulsory
Answer THREE (3) questions

MRUC observes ZERO tolerance to examination irregularities

Question ONE: (30 MARKS) – COMPULSORY

a) Highlight the benefits of object oriented software development methodology (4 marks)

b) Explain the use of :

i.) Class diagram. (2 marks)

ii.) deployment diagram. (2 marks)

iii.) State Chart Diagram (2 marks)

iv.) Sequence diagram. (2 marks)

c) The following is a use case description of the examination paper preparation support system. Draw a UML activity diagram according to the description. (8 marks)

Use case name: submit question

Participant: lecturer

Entry conditions:

1. The question is ready and stored in a file
2. The lecturer is assigned to the module

Exit conditions:

1. The file is uploaded to the system
2. The module leader is notified of the availability of the question
3. The event is logged by the system

Flow of Events:

1. The lecturer logs into the system by entering his/her username and password;
2. The system checks the username and password;
3. The system displays the list of modules of which he/she is the lecturer, module leader and/or internal examiner;
4. The lecturer selects a module and his/her role in the module as a lecturer;
5. The system prompts the user to enter the file name and location on his/her computer, and additional information if any;
6. The lecturer enters file name and location, and types in the additional information;
7. The lecturer submits the questions and the file is uploaded to the system;
8. The system saves the file;
9. The system confirms the success of uploading the file.
10. The system notifies the module leader of the submission of the questions.

Exceptional conditions and alternative flow of events:

When the username and password is not correct:

3.1: display error message, go back to step 1;

When the lecturer is not listed on the module:

4.1: quit the system;

Special requirements:

1. The file should be encrypted when transmitted from lecturer's computer to the server
2. The notification of success in uploading the file should be within 20 seconds
3. The event should be recorded in a log file to contain the following information:
   a) name of the lecturer,
   b) date and time of the event,
   c) the name of the event (upload exam question),
   d) the file on the server that stores the questions.

d) Briefly explain what takes place in each of the four phases of a Rational Unified Process (RUP) lifecycle. (8 marks)

e) Differentiate between class and object. (2 marks)

Question TWO

a) Explain the notations, symbols and relationships used in user case diagrams (UCD). (8 marks)

b) "*Seats can be reserved by customers on the web site of the bus company. The customer has the option to directly pay for the seat through the website. In that case, the seat cannot be cancelled (neither by the customer nor by the bus company). If the customer has not paid for the seat, the bus company can cancel the seat if the customer does not show up one hour before the trip. When the reservation is cancelled, the seat will become free and can be sold to another customer. Both the customer and the company staff must authenticate themselves for performing operations with the system.*" Draw a use case diagram for describing the functional requirements of the above system (12 marks)

Question THREE

a) Explain UML and its importance in object-oriented systems. (6 marks)

b) Draw well labeled sequence diagram for an ATM System. (8 marks)

c) Explain in detail what is meant by Encapsulation in OOAD and its importance. (6 maarks)

Question FOUR

a) Using relevant examples, explain the following terms with respect to the class diagrams in UML.

i.) Associations (2 marks)
ii.) Multiplicity (Cardinality) (2 marks)
iii.) Composition and Aggregation (4 marks)
iv.) Generalization (2 marks)

c) Draw a class diagram to model the following "*Situations in an electronic point-of-sale (ePOS) system it is envisaged that the customer's uses a Master card for payment. The sequence of events of the Check and Get Pin is triggered when the sales person enters the item details and total cost into system. The card reader prompts for the card, reads the card then prompts the user to press the OK (or Cancel) button to confirm the purchase. It then expects a four digit PIN (personal identification number) to be entered. Failure to enter a four digit number will result in the user being re-prompted for the PIN up to an extra two attempts (the card reader handles this automatically, failure is the same as pressing cancel button in the previous step). On successful completion, it will request that the credit card company verifies the card is valid for that amount and request*". (10 marks)