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

MAIN CAMPUS

ORDINARY UNIVERSITY EXAMINATIONS

2015/2016 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 2016 **TIME: 2 HOURS**

INSTRUCTIONS TO CANDIDATES

Answer Question ONE (1) (compulsory) AND any other TWO

Question ONE

a) Explain UML and its importance in object-oriented systems. [5 marks]

b) Identify the steps to be followed when carrying out object oriented systems analysis. [5 marks]

c) Highlight the main uses of a Class Diagram [2 marks]

d) Based on the context specified, **identify** the most fitting UML relationship that best describes the relationship between each pair of objects or classes given. Answer with one of the following: *aggregation, association, generation/specification.* In addition, give the UML diagram that describes the relationship you identified. [9 marks]

i) In software process: *People to Development Activity*

ii) In Travel: *Car Trunk* to *Luggage*

iii) In Lab2: *Pet* to *Dog*

e) *A UPS Store offers a variety of services to its customers. One can fax documents, purchase packaging materials, ship packages via UPS either ready to ship (you package items yourself), or optionally, have store personnel package the items to make them ready to ship. Of course it is implied that you have to pay for these services, either by cash or by credit card. A receipt of your transaction is always returned before you leave the store.* Identify four major use cases in this scenario. [4 marks]

f) Briefly explain the concept of collaboration with a diagram. [5 marks]

Question TWO

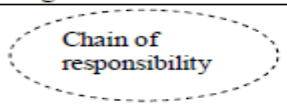
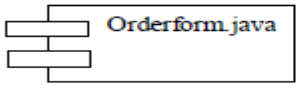
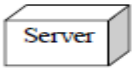
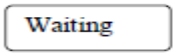
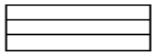
a) Highlight FOUR advantages of Modeling. [4 marks]

b) *To give an exam, an instructor first notifies the students of the exam date and the material to be covered. She then prepares the exam paper (with sample solutions), gets it copied to produce enough copies for the class, and hands it out to students on the designated time and location. The students write their answers to exam questions and hand in their papers to the instructor. The instructor then gives the exam papers to the TAs, along with sample solutions to each question, and gets them to mark it. She then records all marks and returns the papers to the students.*

Required

Draw a sequence diagram that represents this process. Make sure to show when each actor is participating in the process. Also, show the operation that is carried out during each interaction, and what its arguments are. [11 marks]

c) The table below shows the building blocks of the Unified Modeling Language (UML). Study the diagrams carefully and name each of them. [5marks]

Building blocks of UML	
Diagram	Name
	Colaborations
I 	.....
Ii 	.....
iii 	.....
iv 	.....
v 	.....

Question THREE

a) Differentiate between the following as used in object oriented analysis and design using UML.

i) Attributes and operations in a class [2 marks]

ii) Component diagram and deployment diagram [2 marks]

iii) Class and active class [2 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.*

Required

Draw a use case diagram for describing the functional requirements of the above system. [10 marks]

c) Give a brief note on object behavior. [4 marks]

Question FOUR

a) In Model a scenario of the Withdraw Money use case of a Bank ATM system. The user is able to make withdrawal of money. The system employs a standard procedure of validating the card and account holder's password.

i.) List any two main objects (2 marks)

ii.) Describe the main flow of events in this scenario. (6 marks)

b) Consider the world of libraries. A library has books, videos, and CDs that it loans to its users. All library material has id# and a title. In addition, books have one or more authors, videos have one producer and one or more actors, while CDs have one or more entertainers. The library maintains one or more copies of each library item (book, video or CD). Copies of all library material can be loaned to users. Reference-only material is loaned for 2hrs and can't be removed from the library. Other material can be loaned for 2 weeks. For every loan, the library records the user, the loan date and time, and the return date and time. For users, the library maintains their name, address and phone number. Draw a class diagram (or two, if this is more convenient) for the description above. Make sure to show attributes, multiplicities and aggregations/compositions, where appropriate. No need to show any operations. [12 marks]

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