TECHNICAL UNIVERSITY OF MOMBASA

UNIVERSITY EXAMINATION FOR:

BACHELOR OF TECHNOLOGY IN INFORMATION COMMUNICATION TECHNOLOGY/ BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY

BTIT 4210 : OBJECT – ORIENTED ANALYSIS AND DESIGN

BIT 2214 : OBJECT – ORIENTED SYSTEM AND DESIGN

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES:

TIME: HOURS

DATE:

Question ONE

(a.)   Explain the significance of stereotypes in UML modeling and with aid of appropriate examples explain how stereotypes are used in each of the following:

        (i.)   Use cases

        (ii.)   Class diagrams   (4 marks)

(b.)   A message is passed from object A to object B. Which object has the responsibility? Explain.
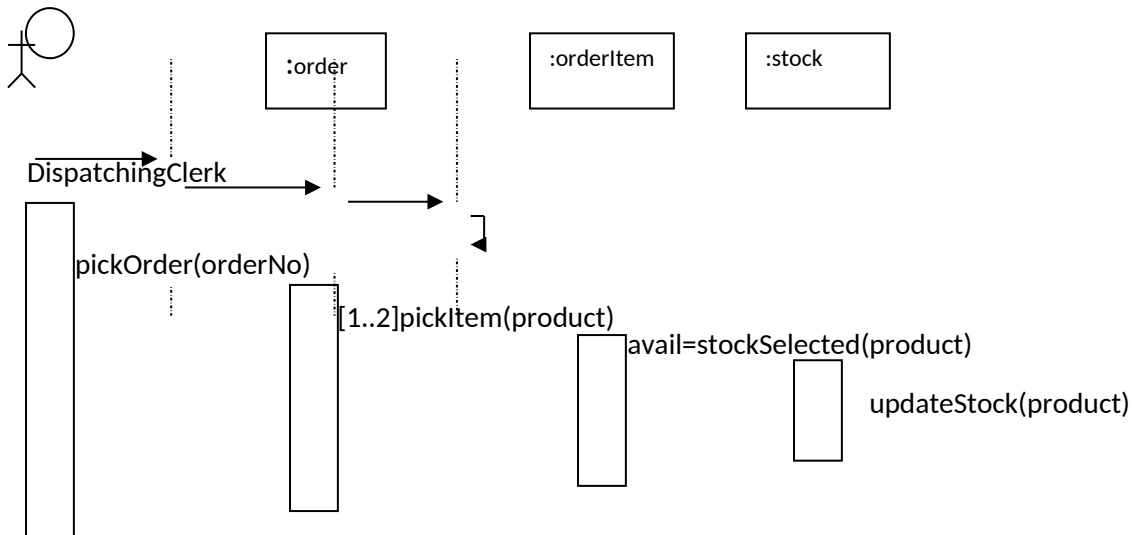
            (2 marks)

(c.)   Explain the significance of iterations in the RUP methodology   (4 marks)

(d.)   The following sequence diagram describes the ordering process in a company. Give a written explanation of the process taking place.

       (5 marks)

(e.)   (i.)   Outline how you would determine an aggregation relationship.   (4 marks)

       (ii.) With aid of a practical example show how a composition relationship can be represented using UML notations.   (4 marks)

(f.)   Differentiate between the following terms

               (i.)   Event and an action

               (ii.)   Internal transition and self transition

                                                                                                                      (4 marks)

(g.)   It is a fact that an object is a self-managing entity. How does an object achieve this fact? Discuss.

                                                                                                                      (3 marks)

Question TWO

With the aid of appropriate examples discuss how relational database systems can be extended to become object oriented relational database systems.   (6 marks)

(a.)   Robustness analysis involves analyzing the narrative text of each use cases and identifying sets of objects into entity, boundary and control objects. Clearly explain the significance of each of the objects and suggest guidelines that could be used to come up with an object from each of the categories. (6 marks)

(b.)   Use the description of the use case "Cancel Unshipped product" below to draw a sequence diagram. The use case describes how a customer can return an unshipped product to the company.   (8 marks)

Flow of events:

1.   Use case starts when the customer logs in to her customer account

2.   Customer selects display pending orders

3.   System display the details of the order including whether or not each product has been shipped

4.   Customer selects a line item for unshipped and changes the quantity

5.   System calculates the revised discount and shipping costs and informs the amount refunded to the customer

6.   System sends an email to the shipping department

Question THREE

(a.)   Briefly distinguish between the terms Object Oriented Analysis and Object Oriented Design. As you distinguish clearly bring out the emphasis of each activity.   (4 marks)

(b.)   Distinguish between the following pairs of terms:

(i.)   Domain analysis and domain model.

(ii.)   Requirement and use case   (4 marks)

(c.)   What should a software engineer do in projects where (s)he has pre-specified requirements? Explain.

(2 marks)

(d.)   Why are use cases important in software development? Explain.   (5 marks)

(e.)   How do we gather information during the domain analysis stage? Explain.   (3 marks)

(f.)   Explain each of the following terms:

(i.)   Domain

(ii.)   Green-field development   (2 marks)

Question FOUR

(a.)   Make distinction of each of the following constructs

(i.)   Composite and multivalued attribute

(ii.)   Candidate key and identifier of a class   (4 marks

(b.)   With aid of appropriate example show how each of the following can be modeled in UML.

i.   Composite

ii.   Multivalued   (4 marks)

(c.)   Explain the role of analysis class diagram in Object Oriented analysis and design.   (6marks)

(d.)   Develop a Conceptual data Model (using class diagram) for the following description.   (6marks)

Each semester a student must be assigned an advisor who counsels' students about degree requirements and help students register for classes. Students must register for classes with the help of an advisor, but if their assigned advisor is not available they may register with any advisor. Assume Student and Advisor are classes. We must keep track of students, their assigned advisors, and with whom the student registered for the current term.

Question FIVE

(a.)   i.   Briefly explain the dependency relationship in a class diagram.

          ii.   Give the different kinds of the dependency relationship that are common in class diagrams.

                                                                                   (7 marks)

(b.)   Examine the following bank scenario and answer the questions that follow:

A bank contains many customer records. An account can be opened at the bank, and deposits or withdrawals can also be made. Customer records that the bank holds are about the account(s) customers have in the bank. Every account contains details such as customer name, account number and the current balance. There are two types of accounts that the bank can maintain namely: savings and current. A savings account has a minimum balance that a customer must maintain at any given time; whereas for a current account customers have an overdraft which also has a limit. A customer with a current account can withdraw up to the overdraft limit whereas a customer with a savings account can only be allowed to withdraw up to the minimum balance put by the bank for that account. Each account also maintains a series of transaction records which detail the type of transaction (i.e. debit or credit) and the amount being transacted.

From the above do the following tasks:

i.   Identify the classes that evident in the description text above.

ii.   Identify the attributes and operations for the classes in (i.).

iii.   Identify the relationship instances that exists between these classes.

iv.   Draw a design class diagram for that will fit the above description.

                                                                           (13 marks)