



# THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

*Faculty of Engineering and Technology*

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATION FOR DEGREE IN  
BACHELOR OF TECHNOLOGY IN INFORMATION & COMMUNICATION  
TECHNOLOGY (BTech. ICT. 11M)

EIT 4210: OBJECT ORIENTED ANALYSIS AND DESIGN

**END OF SEMESTER II EXAMINATION**

**SERIES: DECEMBER 2011**

**TIME: 2 HOURS**

## **Instructions to Candidates:**

You should have the following for this examination

- *Answer Booklet*

This paper consist of **FIVE** questions in **TWO** sections **A & B**

Answer question **ONE (COMPULSORY)** and any other **TWO** questions

Maximum marks for each part of a question are as shown

This paper consists of **THREE** printed pages

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## **SECTION A (Compulsory)**

### **Question 1 (30 marks)**

- (a.) Define the term requirements engineering and briefly discuss the activities it entails. (5 marks)
- (b.) (i.) Outline the main objective of use cases as a requirement specification technique. (2 marks)  
(ii.) Briefly explain the major elements that you need to identify when doing use case analysis. (4 marks)
- (c.) (i.) Define the term iteration as used in the Unified Process. (2 marks)  
(ii.) Why are iterations important in the Unified Process? (5 marks)
- (d.) Discuss the problems of using a natural language in specifying requirements. (3 marks)
- (e.) (i.) What is an object oriented system? (2 marks)  
(ii.) Why is object interaction important in an object oriented system? (2 marks)
- (f.) Briefly explain the concept of message passing as used in object orientation. (2 marks)

(g.) Outline the **THREE** major components of a class.

(3 marks)

**SECTION B (*Attempt any TWO questions*)**

**Question 2 (20 marks)**

- (a.) (i.) Define the term domain analysis. (1 mark)
- (ii.) Why is domain analysis important? (3 marks)
- (b.) How do we gather information during the domain analysis stage?  
(3 marks)
- (c.) What should a software engineer do in projects where (s) he has been given pre-specified requirements? (2 marks)
- (d.) What does the term “green field development” mean? As you explain, describe the categories of software projects that fall under this class. (5 marks)
- (e.) (i.) Why do we need to state a problem statement in any software project? (2 marks)
- (ii.) What are desirable properties of a good problem statement? (2 marks)
- (f.) What limits the list of sub tasks in requirements analysis? (2 marks)

**Question 3 (20 marks)**

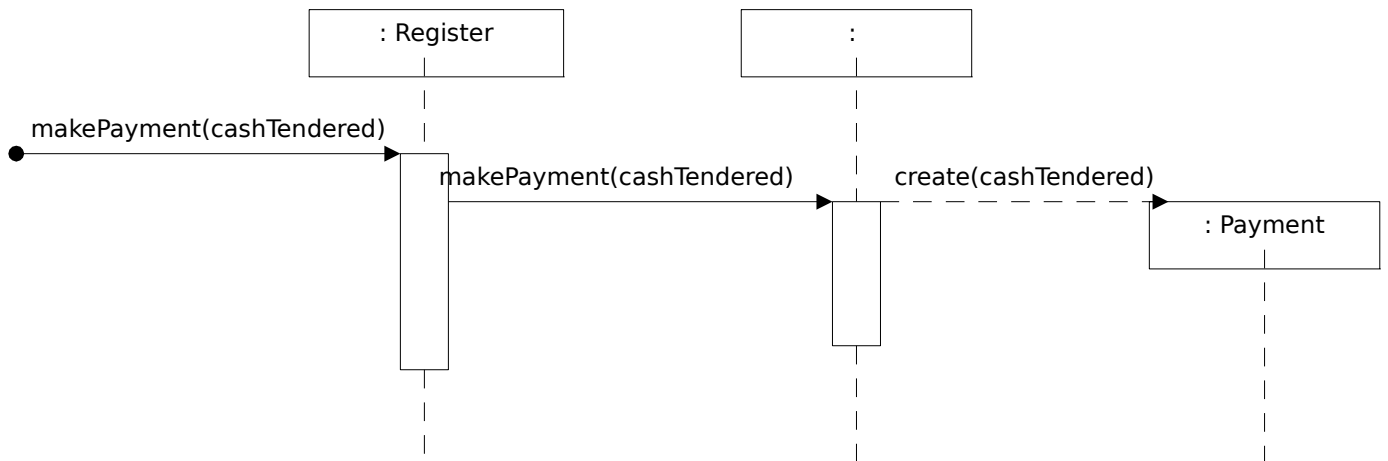
- (a.) (i.) In your own words define the term requirement. (1 mark)
- (ii.) Distinguish between the two categories of a requirement. (4 marks)
- (b.) Describe the **THREE** different types of non – functional requirements which may  
(c.) be placed on a system. Give examples of each of these types of a requirement.  
(6 marks)
- (d.) Briefly distinguish between the terms use case analysis and use case model. (4 marks)
- (e.) Why are use cases important in software development? Explain. (5 marks)

**Question 4 (20 marks)**

- (a.) The fundamental relationship instances in a class diagram are:  
(i.) Use  
(ii.) Aggregation  
(iii.) Inheritance  
For each relationship instance give the condition and notation used for the relationship instance. (9 marks)
- (b.) Give the main steps in developing a class diagram for a use case. (4 marks)
- (c.) What is meant by ‘use case realization’? (3 marks)
- (d.) (i.) Distinguish between a link and an association.  
(ii.) What is multiplicity and why can’t it be a constraint? (4 marks)

**Question 5 (20 marks)**

- (a.) (i.) What is an Interaction diagram? Why is important? (2 marks)
  - (ii.) Briefly distinguish between a collaboration diagram and a sequence diagram. (3 marks)
  - (iii.) How do asynchronous messages differ from synchronous messages - in their behaviour and in their notation? (3 marks)
  - (iv.) Briefly explain the basic elements that constitute a collaboration diagram. (2 marks)
- (b.) Examine the following sequence diagram and answer the questions that follow:



- (i.) Briefly explain what is happening in the sequence diagram above. (5 marks)
- (ii.) Write a partial definition (in Java) of the class Sale. (5 marks)