KISII UNIVERSITY
UNIVERSITY EXAMINATIONS

SECOND YEAR EXAMINATION FOR THE AWARD OF THE DEGREE OF BACHELOR OF SOFTWARE ENGINEERING
SECOND SEMESTER, 2023/2024
(AUGUST-DECEMBER, 2023)

SOEN 201: OBJECT ORIENTED ANALYSIS & DESIGN

STREAM: Y2 S1   **TIME: 2 HOURS**

DAY: MONDAY, 03:00–5:00 PM   **DATE: 27/11/2023**

INSTRUCTIONS
1. *Do not write anything on this question paper.*
2. *Answer Question ONE [Compulsory] and any other TWO Questions.*

QUESTION ONE [30 MARKS]

a. Describe how object oriented analysis and design differs from structured analysis and design   [4 Marks]

b. Assume you are a team leader of a team that has been tasked to undertake analysis of an ERP system of an institution of higher learning, Explain the main activities that your team will be expected to carry out   [6 Marks]

c. Describe various problems associated with designing a system using purely objects. In each case explain how those problems can be mitigated. [4 Marks]

d. Discuss the relationship between the concept of information hiding as an attribute of effective modularity and the concept of module independence
[4 Marks]

e. With the use of an example, distinguish between use case include and use case extend relationships   [4 Marks]

f. With the use of an example distinguish between an aggregate relationship and a composition relationship in a class diagram   [4 Marks]

g. Describe the main elements of a sequence diagram.   [4 Marks]

QUESTION TWO [20 MARKS]

a. Models are used during analysis phase to help elicit the requirements and during design to describe the system to implementation engineers and during. While stating the appropriate diagram for each case, explain the different perspectives for which you can develop a model for an object oriented system

[10 Marks]

b. Draw a use case diagram to show the interactions that takes place when a student reports session in the university ERP system　　　　　[10 Marks]

QUESTION THREE [20 MARKS]

a. Explain circumstances when appropriate to implement a modular design as a monolithic software　　　　　　　　　　　　　　　　　　[10 Marks]

b. Based on your experience with a bank ATM, draw an activity diagram that models the data processing involved when a customer withdraws money from the ATM.　　　　　　　　　　　　　　　　　　　　　　[10 Marks]

QUESTION FOUR [20 MARKS]

a. While referring to class Employee, describe how the access modifiers are used to decide the visibility of attributes and operations in a class　　[10 Marks]

b. Students have a student number and are on a particular course e.g. BIT. Courses have duration (number of years). Each course has a maximum of 7 units per semester. Each course belongs to a given department. A course cannot commence if it has not attained a minimum requirement of enrolling 15 students. Identify different objects, their attributes and the operations. Undergraduate students should enrol for a maximum of 6 units a semester while postgraduate students will enrol for a maximum of 4 units a semester. Each unit is taught by a lecturer who could be a part time lecturer or Full time Lecturer. Model this scenario using a Class diagram　　　　　[10 Marks]

QUESTION FIVE [20 MARKS]

a. Draw a state machine diagram that shows the different states that a student goes through right from the time a student reports session until when a student sits for his/her final exams　　　　　　　　　　　　[10 Marks]

b. Discuss the benefits of using Unified Modeling Language in analysing and designing object oriented systems　　　　　　　　　　　　　[10 Marks]