(Knowledge for Development)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS
2017/2018 ACADEMIC YEAR

SPECIAL/SUPPLEMENTARY EXAMINATIONS
YEAR THREE SEMESTER TWO EXAMINATIONS

FOR THE DEGREE OF
BACHELOR OF SCIENCE COMPUTER SCIENCE

COURSE CODE   :   CSC 366E

COURSE TITLE   :   OBJECT ORIENTED ANALYSIS
AND DESIGN

DATE: 19/10/2018   TIME: 9:00 A.M – 11:00 A.M

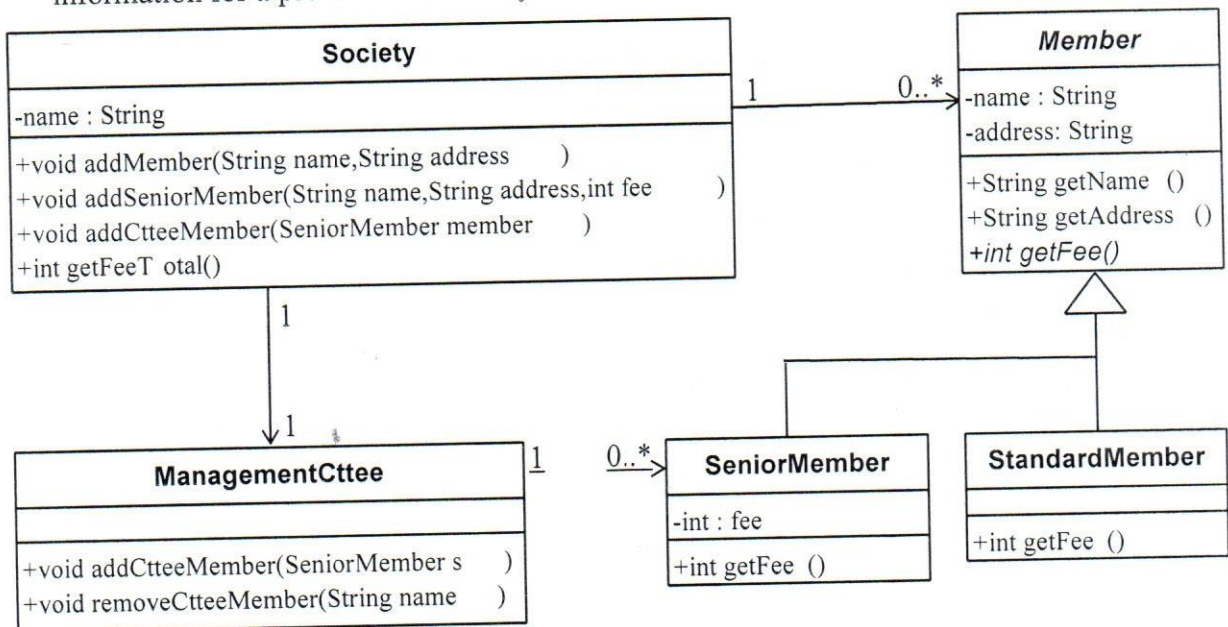INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

QUESTION ONE [30 MARKS]

a. Write a short note on "Object-Oriented Software Life Cycle.   [4 marks]

b. Write a short note on Object-Oriented Modeling Technique.   [5 marks]

c. Discuss the qualities of Object-Oriented techniques.   [5 marks]

d. The goal of Analysis model is to develop a model of what of the system will do? Draw a Analysis model for Banking System.   [6 marks]

e. Explain the software development life cycle of object-oriented approach.   [6 marks]

f. What is meant by object-oriented design model? Also discuss the input and output of object-oriented design.   [5 marks]

g. Discuss object-oriented testing strategies in detail.   [6 marks]

h. Draw the sequence diagram of login page.   [6 marks]

Draw the activity diagram of ATM Machine system   [5 marks]
What do you mean by class diagram? Where it is used and also discuss the steps to draw the class diagram with any one example.   [7 marks]

QUESTION TWO [20 MARKS]

a. Consider this UML class diagram showing part of a program to manage the membership information for a professional society:

Society

-name : String

+void addMember(String name,String address   )
+void addSeniorMember(String name,String address,int fee   )
+void addCtteeMember(SeniorMember member   )
+int getFeeT otal()

1   0..*

Member

-name : String
-address: String

+String getName ()
+String getAddress   ()
+int getFee()

ManagementCttee

+void addCtteeMember(SeniorMember s   )
+void removeCtteeMember(String name   )

SeniorMember

-int : fee

+int getFee ()

StandardMember

+int getFee ()

i. Write a Java version of class ManagementCttee assuming it has this constructor:public ManagementCttee() **[6 marks]**

ii. Class Member is an abstract class. Explain the role of an abstract class. **[2 marks]**

iii. Write a Java version of class Member assuming it has this constructor: public Member(String name, String address) and that the method getFee() is abstract.

[4 marks]

iv. Write a Java version of class StandardMember assuming it has this constructor: public StandardMember(String name, String address) and the standard membership fee is fixed at ksh. 800. **[4 marks]**

v. Write a Java version of class SeniorMember assuming it has this constructor: public SeniorMember(String name, String address, int fee) where the membership fee is set when a SeniorMember object is created. **[4 marks]**

QUESTION THREE [20 MARKS]

Sports World is an Events Management Company that organise the running of major sporting games, such as the Commonwealth Games. Before being used to host a sporting event, venues are assessed by an Administrator who checks that they are for fit for purpose. If the venue can hold more than 10,000 people, the Administrator conducts additional health and safety checks to ensure that the venue is safe. A year before the games begin, a Team of Staff are appointed to run the day-to-day operations, including booking successfully assessed/safety-checked venues. Six months before the games begin, the Team of Staff produce a Programme that lists the date, time and location of each sporting event. At this point, Athletes can register for an event by giving their name, address, date of birth and best time for their event. Some overseas athletes need to apply for a visa and the system needs to record whether they were successful. A week before the games begin, staff produce a Schedule that shows when the registered athletes will participate in their event. At the end of each event, staff produce a Table of Results that records the positions of each athlete. Once all the events are completed, the administrator checks the Table of Results for accuracy and produces a Medals Table.

a. Produce a Use Case diagram for the above scenario. [12 marks]

b. Discuss how Use Case diagrams and descriptions provide an overview of the user requirements of a system. Within your answer include examples from the above scenario. [8 marks]

QUESTION FOUR [20 MARKS]

Global University is a university that specialises in distance learning courses, where its students study their degree courses at home, rather than on campus. Each course is made up of a number of modules and the students have to pass the assessments associated with the module. Some modules have an examination that is part of the assessment, which requires the student to attend a venue to attempt the exam paper.

A system is required to handle this examination process:

An Administration Officer has to book the venues needed to hold the examinations. Most venues require an initial deposit to secure the booking, which the Administration Officer can authorise from their budget. Three months before the exam, the students are sent a list of their nearest venues and they have to pick which one they will attend. Once these are confirmed, the Administration Officer will allocate how many invigilators are needed for the examination.

On the day of the examination each student needs to register and bring proof of identify. An Invigilator will check this and for auditing purposes will record what proof was presented. After the examination is completed, one of the Invigilators will check the number of scripts matches the number of students in attendance.

After the examination is complete one of the Invigilators will send the scripts to the Administration Officer. The Administration Officer will then send the scripts to the appropriate Examiner, who will mark the scripts.

Not all students will attend the exam for various reasons and if they have a valid reason for non-attendance, such as illness, they can apply for mitigation so that they can attend the next iteration of the examination, without financial penalty.

Once marked, the Examiner will return the scripts to the Administration Officer, who will generate a list of results for the examination board.

a. Draw a Use Case diagram for this system.   [10 marks]

b. Discuss the role of Use Cases (diagrams and descriptions) in the development of an object oriented system. Include examples where appropriate.   [10 marks]

QUESTION FIVE [20 MARKS]

a. When developing any system it needs to be tested. Discuss which techniques are appropriate for testing systems developed using an object oriented technology.

[10 marks]

b. Given the following classifications for design patterns: *Creational Patterns:*

Abstract factory, Builder, Object Pool and Singleton patterns

Structural Patterns:

Adaptor, Decorator, Façade and Proxy patterns

Behavioural Patterns:

Command, Iterator, Observer and State patterns

Pick ONE design pattern from EACH of the above classifications and give a detailed description of each, which should include what the problem they address and an example of their use.   [10 marks]