UNIVERSITY OF BUEA
FACULTY OF ENGINEERING
END OF FIRST SEMESTER EXAMINATION

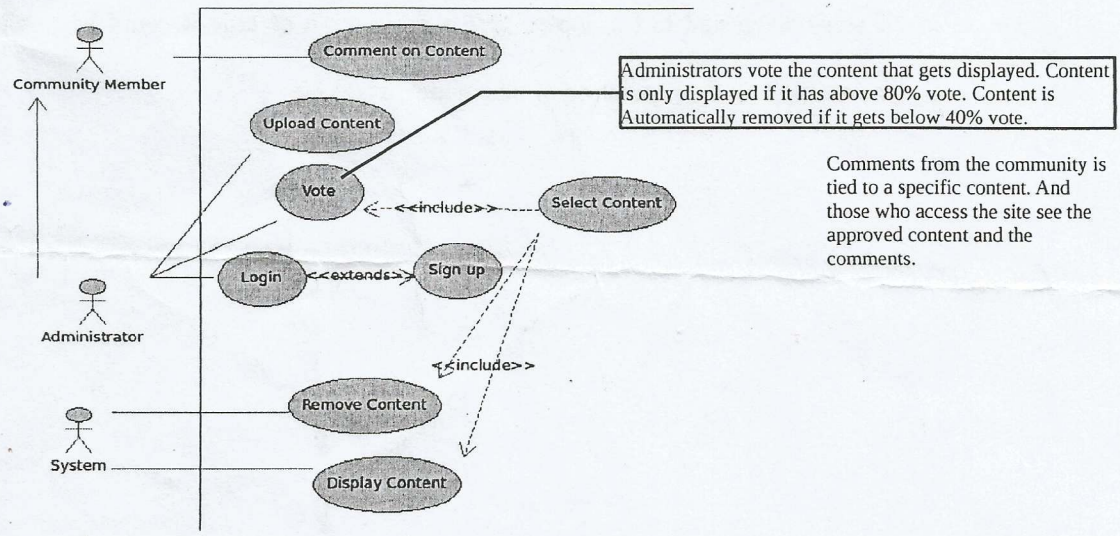
DEPARTMENT: Computer Engineering **ALLOWED TIME:** 3 Hour

DATE: February 2014 **COURSE:** CEF407 – Object oriented modelling

INSTRUCTIONS: Read through each question before you start answering. Answer all questions. All questions carry equal marks.

Question 1

In a project to develop a web application for a company, the engineers decide to design a "Living" web application. They define a "Living" web application is one in which the content is constantly and continually modified by those who interact with the application. The central piece of the project is in the site's engine. You have been assigned to work on the UML specification of the design phase of the project. Study the Use case diagram prepared by the requirements engineers and answer the questions that follow.



(a) What suggestions can you make to the requirements Engineers on their use case diagram? **(5mks)**
(b) Present a UML state diagram, with no less than 4 states, for the application's engine. **(8mks)**
(c) Draw a UML Activity diagram for any 4 of the cases in the use case diagram **(8mks)**
(d) Given that the application is to be implemented using the MVC architecture. What Controller classes do you propose should be implemented? (please state their roles) **(5mks)**
(e) Draw a sequence diagram for the functioning of the engine **(4mks)**
(f) State and briefly describe 3 other UML diagrams that are relevant to the development of a complete UML model for the "living website" engine **(6mks)**

Question 2

A mobile bulletin board (MBB) is an electronic platform on which information is posted and accessed via mobile phones. It is a growing phenomenon. Thus developing and simulating a model for this phenomenon is worth engaging in. In an attempt to develop this model, a directed graph approach was taken. The model has the following characteristic:

1. The set of vertices (V) is partitioned into two disjoint sets V1 – set of individuals who have setup a mobile bulletin board on their phones (owners) and V2 – set of individuals who have not a setup mobile bulletin board (followers).
2. The set of edges (E), consist of ordered pairs of vertices (v_i, v_j), such that v_i is from the set of followers (V2.) and v_j is from the set of mobile bulletin board owners (V1).
3. The set of edges (E), may contain multiple entries of the same ordered pair.

A typical use case of MBB is when the followers access information from the owners bulletin board modeled as point 2 above.

(a) What are some of the important characteristics of this graph model? **(2mks)**

(b) Describe how you think you could model this phenomenon Using NetLogo **(5mks)**

(c) Discuss the drawbacks of the above described model. **(8mks)**

(d) Do you think that the graph model is an appropriate approach? Why? **(5mks)**

(e) Suggest two other ways in which the phenomenon can be modeled. **(2mks)**

(f) For each of the ways suggested in (e) above, give a description of how it could be implemented in NetLogo **(8mks)**

(g) State 5 thinks you would like the simulation of this model to address **(5mks)**