KIBABII UNIVERSITY COLLEGE

SCHOOL OF COMPUTING & INFORMATICS

UNIVERSITY EXAMINATIONS
2012/2013 ACADEMIC YEAR

FIRST YEAR SECOND SEMESTER EXAMINATIONS

FOR THE DEGREE OF
MASTER OF SCIENCE (INFORMATION TECHNOLOGY)

COURSE CODE: MIT824

COURSE TITLE: Security Architecture & Analysis

INSTRUCTIONS TO CANDIDATES
Attempt any three (3) Questions

Instructions: Attempt any three (3) Questions

Question One

a) "Security-related functions that handle sensitive data pervade the architecture, which implies that security needs to be considered in every aspect of the design and must be designed in from the start (it's very difficult to bolt on security afterwards). Discuss the statement and recommends properties that security architecture should have; **[10 Marks]**

b) Discuss the development of secure and survivable architectures requirements **[10 Marks]**

Question Two

a) The architecture employs a security kernel to implement its security mechanisms. This kernel provides the interface between the outside world and the architecture's objects (intra-object security) and between the objects themselves (inter-object security). The security related functions are contained in the security kernel in your view explain with reasons **[12 Marks]**

b) Discuss reliable implementation of security strategies **[8 Marks]**

Question Three

a) To maintain their capabilities to deliver essential services, survivable systems must exhibit the four key properties of resistance, recognition, recovery ("the three R's") and adaptation; Discuss these four key properties **[12 Marks]**

b) Discuss analytical methods to assess and improve system security and survivability **[8 Marks]**

Question Four

a) Survivability is the capability of a system to fulfill its mission, in a timely manner, in the presence of attacks, failures, or accidents. A key characteristic of survivable systems is their capability to deliver essential services, maintain essential properties and Essential components. Discuss the terms essential services, maintain essential properties and Essential components. **[12 Marks]**

b) Discuss security threats and architecture strategies **[8 Marks]**

Question Five

a) Just as the software architecture is based on a number of design goals, so the security architecture, in particular the cryptlib security kernel, is also built on top of a number of specific principles. Discuss **[8 Marks]**

b) Using the Survivability Requirements Specification Method require the following, discuss how they interrelate **[12 Marks]**

i. Mission analysis
ii. System environment analysis
iii. Usage analysis
iv. Trade-off analysis