



# THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

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**MAIN EXAMINATION**

**JANUARY – APRIL 2018 TRIMESTER**

**FACULTY OF SCIENCE**

**DEPARTMENT OF COMPUTER AND LIBRARY SCIENCE**

**REGULAR PROGRAMME**

**CMT 405: INFORMATION SYSTEMS SECURITY**

<b>Date: APRIL 2018</b>	<b>Duration: 2 Hours</b>
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<b>INSTRUCTIONS: Answer Question ONE and any other TWO Questions</b>
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- Q1. a) Briefly explain what you understand by the term Computer Security  
**(2 Marks)**
- b) Give a description of the following terms in relation to systems security
- i) Vulnerability
  - ii) Backdoors
  - iii) Denial of service attack
  - iv) Eavesdropping
  - v) Information disclosure
- (10 Marks)**
- c) In 1949, Claude Shannon [SHA49] proposed several characteristics that identify a good cipher. Briefly explain atleast two  
**(4 Marks)**
- d) Briefly differentiate the following terms in relation to program security
- i) virus
  - ii) worm
- (4 Marks)**
- e) The basis of protection is separation i.e. keeping ones user's objects separate from other users. Rushby and Randell noted that separation in an operating system can occur in several ways. Give a brief description of atleast two  
**(4 Marks)**
- f) What do you understand by the term Digital Signature  
**(2 Marks)**

- g) There are different threats to Networks and in particular threats in transit. With respect to that briefly differentiate between Eavesdropping and Wire Tapping **(4 Marks)**
- Q2. a) There are numerous cybercrime prevention tips. Briefly explain atleast five of them **(10 Marks)**
- b) Differentiate the following terms as used in cryptography  
i) Encryption  
ii) Decryption **(4 Marks)**
- c) An ideal Cryptographic hash function has four main properties. Briefly explain atleast two of them **(4 Marks)**
- d) Briefly explain what you understand by the term buffer **(2 Marks)**
- Q3. a) Public Key Cryptography is often used to secure electronic communication over an open networked environment such as the internet. Write short notes on Public Key Cryptography **(4 Marks)**
- b) A virus can either be transient or resident. Briefly explain explain transient and resident in relation to security **(4 Marks)**
- c) If we consider operating systems from the perspective of users, there are general security services that operating systems provide. Give a brief description of these services **(8 Marks)**
- d) Describe briefly what you understand by the term security policy **(2 Marks)**
- e) Write short notes about firewall **(2 Marks)**
- Q4. a) Firewalls have a wide range of capabilities. Briefly explain atleast five types of firewalls **(10 Marks)**
- b) Briefly explain a business continuity plan and explain atleast two characteristics associated with it. **(4 Marks)**
- c) If a security policy is written poorly, it cannot guide the developers and users in providing appropriate security mechanisms to protect important assets to the institution like its data. Provide atleast four characteristics that make a security policy a good one **(4 Marks)**
- d) What do you understand by the term Non - Repudiation in security. **(2 Marks)**

- Q5. a) Some People in the legal process or profession do not understand computers and computing, so crimes involving computers are not always treated properly. Briefly explain at least four reasons why this is so  
**(8 Marks)**
- b) There are five principles of security. Briefly explain at least three of them  
**(6 Marks)**
- c) Briefly explain what you understand by the term symmetric key Cryptography  
**(2 Marks)**
- d) Briefly explain at least two qualities that may make it appealing for a virus to thrive  
**(2 Marks)**
- e) It is impossible to prevent natural disasters, but through careful planning it is possible to reduce the damage they inflict. Some measures can be taken to reduce their impact. Because many of these perils cannot be prevented or predicted, controls focus on limiting possible damage and recovering quickly from a disaster. Briefly name at least two of this natural disasters  
**(2 Marks)**

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