



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS

DEPARTMENT OF COMPUTER SCIENCE AND SOFTWARE ENGINEERING

**UNIVERSITY EXAMINATION FOR THE DEGREE OF DOCTOR OF PHILOSOPHY
IN INFORMATION TECHNOLOGY SECURITY AND AUDIT**

1ST YEAR 1ST SEMESTER 2018/2019 ACADEMIC YEAR

KISUMU CAMPUS

COURSE CODE: IIT 6111

COURSE TITLE: ADVANCED ISSUES IN INFORMATION SECURITY

EXAM VENUE:

STREAM: PHD

DATE: 12TH AUGUST 2019

EXAM SESSION: 9.00 – 12.00NOON

TIME: 3.00 HOURS

INSTRUCTIONS:

- 1. Answer ANY three questions**
- 2. Candidates are advised not to write on the question paper**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room**

QUESTION ONE

[20 MARKS]

- (a) “Do not figure out on opponents not attacking; worry about your own lack of preparation”. Illustrate how this statement borrowed from the *Book of the Rings* fit into information security paradigm. [6 Marks]
- (b) James Anderson, an executive consultant at Emagined Security Inc., believes information security in an enterprise is a “well-informed sense of assurance that the information risks and controls are in balance.” Many information security practitioners also recognize that aligning information security needs with business objectives must be top priority. What is your view on this? Discuss your view with support illustrations. [7 Marks]
- (c) Information security has been argued to be an art or a science or both. In your opinion, where do you place information security? Discuss. [7 Marks]

QUESTION TWO

[20 MARKS]

- (a) Researchers, content industry engineers, and administrators attempt to resort to the state-of-the-art technologies and ideas to protect valuable digital contents and services assets against attacks and IP piracy in the emerging ubiquitous network. In the realm of ubiquitous network and multimedia contents security, discuss trusted solutions and secure techniques for ubiquitous network as well as some open issues faced by digital contents, owners/rights, holders/multimedia, and services providers, who dedicate themselves to protect their intellectual property rights and business benefits. [12 Marks]
- (b) Security awareness is an often-overlooked factor in an information security program. While organizations expand their use of advanced security technology and continuously train their security professionals, very little is used to increase the security awareness among the normal users, making them the weakest link in any organization. As a result, today, organized cyber criminals are putting significant efforts to research and develop advanced hacking methods that can be used to steal money and information from the general public. Discuss the need for security awareness programs in schools, universities, governments, and private organizations. [8 Marks]

QUESTION THREE

[20 MARKS]

- (a) “There are several contributing issues to modern enterprise information security which must be understood before attempting to analyse the underlying assumptions and beliefs

that will allow to define a philosophy for managing enterprise information security.”

Discuss [14 Marks]

- (b) Illustrate how the enterprise must foster mental models that internalize security as the fundamental part of everyone’s jobs. [6 Marks]

QUESTION FOUR [20 MARKS]

- (a) Information security incidents are the most obvious reasons for digital forensic investigations. While techniques to extract, preserve and analyze data from isolated systems, individual networks or network systems have been discussed within the digital forensics community in the last few years, digital forensic investigations in organizations have been only discussed at less extent. Discuss on scientifically proven guidelines and techniques that enable digital forensics within enterprise information system infrastructures as well as on measures to heighten the value of evidence gathered from information systems. [8 Marks]

- (b) Trust is an important mechanism for risk perception and has therefore been identified to be a key factor for the success of various electronic environments and platforms. Research efforts has been on soft security mechanisms to establish trust in these environments such as reputation systems and recommender systems. Discuss trust management with focus on security in highly connected IT systems. [6 Marks]

- (c) Explore security aspects arising from the inclusion of heterogenous applications into holistic user portal that allows the interoperability of individual applications on a user interface level. [6 Marks]

QUESTION FIVE [20 MARKS]

- (a) By studying the future information security trends, explore; [14 marks]
- (i) The most important information security trends in the next five to ten years.
 - (ii) The factors and attributes that affect those trends captured in (a)(i) above.
 - (iii) The kind of methods and processes needed to a continuous analysis of these future information security trends.
- (b) Over the years, security experts in the field of Information Technology have had a tough time in making passwords secure. Discuss this issue from the angle of philosophy and cognitive science by exploring the relationship between human senses and passwords to ensure improvement in authentication while making it an enjoyable activity. [6 Marks]

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