### FACULTY OF MANAGEMENT
### NOVEMBER 2015 EXAMINATION

#### DEPARTMENT OF APPLIED INFORMATION SYSTEMS

<table>
<thead>
<tr>
<th>MODULE</th>
<th>COMMUNICATION NETWORKS 3</th>
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<tbody>
<tr>
<td>CODE</td>
<td>CMN03B1</td>
</tr>
<tr>
<td>DATE</td>
<td>12 NOVEMBER 2015</td>
</tr>
<tr>
<td>DURATION</td>
<td>2 HOURS</td>
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<tr>
<td>TIME</td>
<td>12:30 – 14:30</td>
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<td>TOTAL MARKS</td>
<td>100</td>
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<tr>
<th>EXAMINER</th>
<th>MR A. RASSAKI</th>
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<tr>
<td>EXTERNAL MODERATOR</td>
<td>MR M. ADEKOYA (CUT)</td>
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<td>NUMBER OF PAGES</td>
<td>5 PAGES</td>
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#### INSTRUCTIONS TO CANDIDATES:

- Answer ALL questions.
- Write neatly and legibly.
- Number your answers clearly.
- This is a closed book assessment.
- Read the questions carefully and answer only what is asked.
- The general University of Johannesburg policies, procedures and rules pertaining to written assessments apply to this assessment.
SECTION A

Question 1

"Security is, I would say, our priority because for all existing things you will be able to do with computers – organizing your lives, staying in touch with people, being creative – if we don't solve these problems, then people will hold back." - Bill Gates

What is information security and how does it differ from network security? (4)

Question 2

It is often said in information security that security is "inversely proportional" to convenience. Explain (3)

Question 3

In information security, consider network vulnerabilities and attacks:

3.1 Why is an organization's security policy important to how it defends itself against network attacks? (2)

3.2 How does a threat to information security differ from an attack? How can the two overlap? (3)

3.3 What is the difference between a denial-of-service (DoS) attack and a distributed denial-of-service (DDoS) attack? (4)

3.4 Which (DoS or DDoS) is potentially more dangerous and devastating? Why? (4)

Question 4

4.1 What is the difference between a virus and a worm? Which is potentially more dangerous and why? (4)

4.2 What is identity theft? Why is it such a big problem today? How does phishing promote identity theft? (6)
Question 5

5.1 What is an open port? Why is it important to limit the number of open ports a system has to only those that are absolutely essential? (4)

5.2 Why is it important for the local security administrator to understand what ports are being used by applications? (4)

Question 6

6.1 To prevent unauthorized people from copying data from a database, some companies forbid their employees to come to work with USB flash memory devices and subject them to body searches. Is this an effective measure? Why or why not? (4)

6.2 Suppose you started working as a network manager at a medium-sized firm with an Internet presence, and discovered that the previous network manager had done a terrible job of network security. Which four security controls would be your first priority? Why? (8)

SECTION B

Question 1

1.1 Some people believe Bluetooth is a revolution, while others see it as a simple replacement for cables among devices. What do you think? Is Bluetooth a revolution? (4)

1.2 List three possible application areas of Bluetooth. (3)

Question 2

Hacking of a computer system has become prevalent in today's business dealings. Hacking can take on a variety of different forms namely:
(a) Protocol analyzer (sniffer)
(b) Penetration testing
(c) Privilege escalation
(d) Bluejacking
(e) Ransomware
(f) Logic bomb
(g) Bluesnarfing
(h) Man-in-middle

Explain each one of these common hacking tactics. (8)

**Question 3**

3.1 Explain the difference between symmetric and asymmetric encryption. (4)

3.2 When surfing online, you get some strange data on an apparently secure Web site, and you realize you need to check the legitimacy of the site. What kind of organization issues digital certificates? (2)

3.3 How does the size of a key affect the strengths and weaknesses of an encryption technique? Consider both a friendly use of the key and an unfriendly use of the key. (4)

**Question 4**

4.1 How big is the MAC address space? The IPv4 address space? The IPv6 address space? (3)

4.2 Describe the two protocols that are available to create secure transmissions for HTTP sessions? (4)

**Question 5**

5.1 Compare NAT with NAC. (4)

5.2 Describe two methods NAC uses to direct an unapproved client (or a system that do not have adequate security measure) to a quarantine network. (4)

5.3 What are the two primary features that give proxy servers an advantage over NAT? (2)
Question 6

6.1 What are the responsibilities of network security managers and of security administrators?  

6.2 Why would network administrators be concerned with load balancing, segmentation, and bandwidth management?