



DUBLIN INSTITUTE OF TECHNOLOGY

**DT211C BSc. (Honours) Degree in Computer Science
(Infrastructure)**

Year 3

DT228 BSc. (Honours) Degree in Computer Science

Year 3

**DT282 BSc. (Honours) Degree in Computer Science
(International)**

Year 3

SUMMER EXAMINATIONS 2016/2017

SECURITY [CMPU3034]

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DR. DEIRDRE LILLIS
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TUESDAY 9TH MAY

4.00 P.M. – 6.00 P.M.

TWO HOURS

ANSWER ALL QUESTIONS

1.

- 1) Explain the difference between a computer Virus, worm and Trojan horse? [6]
- 2) Prime numbers are very important in encryption schemes. It is Essential to be able to verify if a number is prime or not. Write a piece of pseudocode for any programming language to check if a number is prime? [5]
- 3) Compute the following [8]

$$307^{1001} \bmod 102$$

$$-29 \bmod 7$$

$$\text{GCD}(568, 208)$$

$$\text{lcm}(9, 21)$$
- 4) Pretexting is a type of social engineering to create a scenario and engage a victim. Its goal is to gain their trust and use it to gain information. List 4 types of social engineering? [4]
- 5) Use a diagram to illustrate how Secure Sockets Layer(SSL) works? [6]
- 6) Discuss the 5 steps to conduct successful penetration testing. Assume you had already met with clients and signed the NDA with clients? [5]
- 7) What is Google hacking, give an example? [4]
- 8) List 6 things firms should do to improve cyber security? [6]
- 9) Explain **Confidentiality, integrity and availability** in cyber security, also known as the **CIA triad**. [6]

2.

- 1) Encrypt the following text by using the playfair Cipher (pay no attention to space between the words):

STUNEX WORM

to encrypt this message (Key: keyword) [8]

- 2) Pretty Good Privacy (PGP) is a data encryption and decryption computer program that provides cryptographic privacy and authentication for data communication. Explain how PGP carries out authentication operation. [8]
- 3) A **virtual private network (VPN)** is created by establishing a virtual point-to-point connection through the use of dedicated connections, virtual tunneling protocols, or traffic encryptions. Please give four reasons for using a VPN. [8]

3.

- 1) Alice wants to communicate with Bob, using RSA technology. The message that Alice wants to send Bob is the number 10. Alice Selected two prime integers $p=7$, $q=13$. Use the RSA algorithm to help Alice generate private and public Keys. And encrypt the message. [10]
- 2) Steganography is the art and science of hiding information in a cover document such as digital images in a way that conceals the existence of hidden data. Discuss the disadvantages of using steganography. [8]
- 3) IOS jailbreaking is the process of removing software restrictions imposed by IOS, Apple's operating system, on devices running it through the use of software exploits.
 - i) List 3 types of IOS Jailbreaking and describe each type.
 - ii) Compare IOS jailbreaking with Android Rooting. [8]