



DUBLIN INSTITUTE OF TECHNOLOGY

DT228 BSc. (Honours) Degree in Computer Science

Year 3

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

Year 3

SUMMER EXAMINATIONS 2017/2018

SYSTEMS SECURITY [CMPU3042]

DR. YUPENG LIU

WEDNESDAY 9TH MAY 2.00 P.M. – 4.00 P.M.

TWO HOURS

INSTRUCTIONS TO CANDIDATES

ANSWER ALL QUESTIONS.

1.

- a) Secure Sockets Layer(SSL) is a protocol for Data encryption **and** decryption computer program that provides cryptographic privacy and authentication for data communication. Use a diagram to illustrate how Secure Sockets Layer(SSL) works? [9 marks]

- b) Encrypt the following text by using the playfair Cipher :

FELLOW

to encrypt this message (Key: CIPHER) [10 marks]

- c) Alice wants to communicate with Bob, using RSA technology. The message that Alice wants to send Bob is the number 7. Alice selected two prime integers $p=11$, $q=3$. Use the RSA algorithm to help Alice generate private and public Keys. Also encrypt the message.

[14 marks]

2.

- a) **SQL injection (SQLi)** is an application security weakness that allows attackers to control an application's database – letting them access or delete data, change an application's data-driven behavior, and do other undesirable things – by tricking the application into sending unexpected SQL commands. List 6 ways to defend against SQLi Attacks. [8 marks]

- b) Describe how Viruses can be categorised based on how they attack? Explain each type in detail.

[12 marks]

- c) Discuss the 5 steps to conduct successful penetration testing and ethical hacking projects. Use a diagram to help illustrate your answer.

[13 marks]

3.

- a) 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.

[9 marks]

- b) What are the advantages and disadvantages of **Symmetric** and **Asymmetric** Key Encryption Methods?

[12 marks]

- c) You have been tasked with introducing a new security policy in your company.

The new policy allows employees to use laptops and other mobile devices at home, when travelling and on the company network. Discuss in detail how this policy can be safely rolled out without endangering the company network.

[13 marks]