

9618 Computer Science Paper 3 - Security

Topical questions | 21 questions

1. Question | 9618 Oct-Nov 2021 P3 V1 Q8

- 8 (a)** Describe the purpose of the Secure Sockets Layer (SSL) and Transport Layer Security (TLS) protocols.

..... [2]

- (b)** Explain how SSL/TLS protocols are used when a client-server communication is initiated.

[4]

9618 Computer Science Paper 3 - Security

Topical questions | 21 questions

2. Question | 9618 Oct-Nov 2021 P3 V2 Q8

- 8 (a) Describe the purpose of the Secure Sockets Layer (SSL) and Transport Layer Security (TLS) protocols.

..... [2]

- (b)** Explain how SSL/TLS protocols are used when a client-server communication is initiated.

[4]

3. Question | 9618 Specimen 2021 P3 Q5

5 Ed wants to send a message securely. Before sending the message, the software encrypts it using a symmetric key.

(a) (i) Describe what is meant by **symmetric key encryption**.

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(ii) State **two** drawbacks of using symmetric key encryption.

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(b) The symmetric key is to be exchanged before the message is sent.
To exchange the key securely, the use of quantum cryptography is being considered.

State **two** possible benefits of using quantum cryptography.

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..... [2]

8 A message is to be sent securely. Software uses a key to encrypt the message before it is sent.

(a) (i) Give **two** reasons for using key cryptography.

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[2]

(ii) Give **two** methods of key cryptography that can be used.

1

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[2]

(b) When there is a secure exchange of key(s), the message is sent.

The use of quantum cryptography is being considered for the secure exchange.

(i) State **two** possible benefits of using quantum cryptography.

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[2]

(ii) State **two** possible drawbacks of using quantum cryptography.

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7 A digital signature is used to validate the authenticity of an electronic message.

In order to produce a digital signature, a digital certificate is required.

(a) State how a digital certificate is obtained.

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(b) (i) Explain how a digital signature is produced before the message is sent.

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(ii) Explain how the digital signature can be checked on receipt to ensure that the message has not been altered during transmission.

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8 A message is to be sent securely. Software uses a key to encrypt the message before it is sent.

(a) (i) Give **two** reasons for using key cryptography.

1

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2

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[2]

(ii) Give **two** methods of key cryptography that can be used.

1

2

[2]

(b) When there is a secure exchange of key(s), the message is sent.

The use of quantum cryptography is being considered for the secure exchange.

(i) State **two** possible benefits of using quantum cryptography.

1

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[2]

(ii) State **two** possible drawbacks of using quantum cryptography.

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6 A message is encrypted using a private key and sent to an individual using asymmetric encryption.

(a) State what is meant by a **private key**.

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(b) Describe the process of asymmetric encryption.

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(c) Explain how a digital signature is used to verify a message when it is received.

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6 (a) State **two** differences between symmetric and asymmetric encryption.

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(b) Explain the process by which an organisation may acquire its digital certificate.

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6 A message is encrypted using a private key and sent to an individual using asymmetric encryption.

(a) State what is meant by a **private key**.

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(b) Describe the process of asymmetric encryption.

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(c) Explain how a digital signature is used to verify a message when it is received.

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9 (a) Encryption is used to alter data into a form that makes it meaningless if intercepted.

Describe the purpose of asymmetric key cryptography.

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..... [2]

(b) Identify **two** benefits and **two** drawbacks of quantum cryptography.

Benefit 1

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Benefit 2

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Drawback 1

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Drawback 2

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[4]

5 (a) Encryption is used to scramble data to make it meaningless if intercepted.

Describe the purpose of quantum cryptography.

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(b) Explain the differences between symmetric and asymmetric cryptography when encrypting and decrypting data.

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..... [3]

9 (a) Encryption is used to alter data into a form that makes it meaningless if intercepted.

Describe the purpose of asymmetric key cryptography.

.....

.....

.....

..... [2]

(b) Identify **two** benefits and **two** drawbacks of quantum cryptography.

Benefit 1

.....

Benefit 2

.....

Drawback 1

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Drawback 2

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[4]

7 (a) Describe what is meant by a digital certificate.

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(b) Explain the role of a digital certificate in creating a digital signature.

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14. Question | 9618 May-June 2024 P3 V2 Q4

- 4 Sheila has a customer called Fred. Fred wants to send Sheila a confidential document as part of a transaction.

Explain how Fred uses asymmetric encryption to send his document securely.

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7 (a) Describe what is meant by a digital certificate.

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(b) Explain the role of a digital certificate in creating a digital signature.

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16. Question | 9618 May-June 2025 P3 V1 Q9

9 Secure Socket Layer (SSL) and Transport Layer Security (TLS) are two protocols.

(a) State **two** functions of SSL/TLS.

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[2]

(b) Give **two** examples of situations where the use of SSL/TLS would be appropriate.

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2

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[2]

17. Question | 9618 May-June 2025 P3 V2 Q10

10 Identify the **two** main protocols that form Transport Layer Security (TLS) **and** state the purpose of each.

Protocol 1

Purpose

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Protocol 2

Purpose

.....

[4]

18. Question | 9618 May-June 2025 P3 V3 Q7

7 Secure Socket Layer (SSL) and Transport Layer Security (TLS) are two protocols.

Explain how SSL/TLS is used when client-server communication is initiated.

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19. Question | 9618 Oct-Nov 2025 P3 V1 Q5

5 (a) Identify **two** items commonly found within a digital certificate.

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(b) Explain why a digital certificate is required to validate a digital signature.

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7 (a) Asymmetric encryption is a type of cryptography.

Identify **one** other type of cryptography.

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(b) An organisation holds two asymmetric encryption keys, which they intend to use to receive secure transmissions.

Explain how the organisation makes use of the two keys to receive a secure transmission.

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Outline the process followed to acquire a digital certificate.

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