

3 (a) Explain why protocols are essential for communication between computer systems.

[2]

(b) POP3 is an email communication protocol.

Identify and describe **two** other communication protocols that are used when sending or receiving emails.

Protocol 1

Description

Protocol 2

Description

[4]

(c) Describe **two** ways in which packet switching ensures a complete message is received when passing messages across a network.

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[4]

3 (a) HTTP and IMAP are examples of protocols used in the Application Layer of the TCP/IP protocol suite.

State the purpose of the HTTP and IMAP protocols.

HTTP

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IMAP

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[2]

(b) Describe how files are shared using the BitTorrent protocol.

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[4]

4 Identify **and** describe **three** protocols that are used in the Application Layer of the TCP/IP protocol suite.

Protocol 1

Description

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Protocol 2

Description

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Protocol 3

Description

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[6]

3 (a) The Application Layer and Transport Layer are two layers of the TCP/IP protocol suite.

Describe the purpose of the Application Layer **and** the purpose of the Transport Layer.

Purpose of Application Layer

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Purpose of Transport Layer

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[5]

(b) Describe packet switching as a method of transmitting messages across the internet.

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[4]

4 (a) The Internet layer and Link layer are two layers of the TCP/IP protocol suite.

Describe the purpose of the Internet layer **and** the purpose of the Link layer.

Purpose of Internet layer

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Purpose of Link layer

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[5]

(b) Describe the function of a router in packet switching.

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[4]

4 The TCP/IP protocol may be viewed as a stack that contains four layers: Application, Transport, Internet, Link.

Describe how the layers of the TCP/IP protocol stack interact with each other.

[4]

5 (a) Name and describe **two** protocols used by the Application Layer of the TCP/IP protocol suite.

Protocol 1

Description

Protocol 2

Description

[4]

(b) Explain the purpose and function of the Application Layer in the TCP/IP protocol suite.

[3]