

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

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..... [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 .....

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Protocol 2 .....

Description .....

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..... [4]

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

1 .....

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2 .....

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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 (a)** Identify **one** benefit of circuit switching **and one** benefit of packet switching.

Circuit switching .....

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Packet switching .....

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[2]

**(b)** Identify **two** differences between circuit switching and packet switching.

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2 .....

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[2]

**3** Describe how packet switching is used to pass messages across a network. Do **not** include checking for completeness and resending packets in your answer.

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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]

**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.

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[4]