

THEME A: CONCEPTS · A2.2

Network architecture

Original practice questions · 33 marks · about 50 minutes · covers A2.2.1–A2.2.4

Instructions. Answer all questions. The maximum mark for this paper is [33 marks]. The marks available are shown in brackets. Parts badged **HL** assess higher level only content; standard level students may leave these out.

1**Total: 6 marks**

A small architecture practice has 12 computers and one shared printer. Every device is cabled to a single central switch.

- (a) Describe how the devices are arranged in a star topology. **[2]**

- (b) Explain why one damaged cable does not stop the rest of the practice from working. **[3]**

- (c) State **one** limitation of a star topology. **[1]**

A hospital is designing a network for equipment that monitors patients. The network must keep working even if part of it fails.

- (a) Describe how the devices are arranged in a mesh topology. [2]

- (b) Justify the use of a mesh topology for the hospital rather than a star topology. [3]

- (c) Outline what is meant by a hybrid topology. [1]

A media company must choose between a client-server model and a peer-to-peer model for sharing large video files between its employees.

- (a) Compare the client-server model with the peer-to-peer model. [4]

- (b) Outline **one** real-world application in which the peer-to-peer model is used. [2]

A school network carries traffic from student devices and from the administration office, which handles staff records and examination data.

- (a) Outline what is meant by network segmentation. [2]

- (b) Explain **one** security benefit of placing student devices and administration devices on separate virtual local area networks (VLANs). [3]

The school also decides to subnet its network.

- (a) Describe how subnetting divides a network. [2]

- (b) Outline **one** way in which subnetting helps a network administrator manage the school's resources. [2]

A company decides to run several of its own servers rather than buying hosted services.

- (a) **HL** Describe the function of a domain name server (DNS). [2]

- (b) **HL** Describe the function of a proxy server. [2]

- (c) **HL** Outline **one** reason why the company's file server must be scalable. [2]

END OF QUESTIONS