

14.10 Transmission of Data (Covering Networks)

1. *Protocols and standards are vital for the operation of the Internet.*

- (a) *What is meant by the term protocol? (1 mark)*
- (b) *Give **two** reasons why protocols are necessary. (2 marks)*
- (c) *Give **two** reasons for having standards. (2 marks)*
- (d) *Explain what is meant by a de facto standard. (2 marks)*
- (e) *A Unique Resource Locator (URL), for example <http://www.aqa.org.uk>, can be entered into a browser in order to view that particular web site. Explain why URLs are used. (3 marks)*

a)

a standard set of **rules** used to ensure communication / the proper transfer of data between devices (1) 1 mark

b) **any two:**

- enable communication / the proper transfer of data between devices (1)
- facilitate open systems (1)
- specify data formats (1)
- specify control signals (1)
- minimise communication errors (1) **2 x 1 marks**

c) **any two:**

- so devices are configured the same (1)
- enable communication (1) **(not if given in b)**
- enable open systems / different manufacturers devices compatible (1)

(not if given in b)

- different software can read data (1)
- different hardware can read data (1)
- provide error detection/correction (1) **(not if given in b) 2 x 1 marks 2 marks**

d)

• arise through historic precedent / sales success / popular choice (1) adopted without formal acceptance by professional / official bodies / appropriate example (1) **(2, 1, 0) marks 2 marks**

e) **1 mark per point**

- Points to a specific website/ unique website identifier (1)
- Maps to an IP address for a target device (1)
- Is in human readable form/ is understandable for humans (1)
- Is more memorable/ more likely to be remembered (1)
- Can be redirected to map to changing IP addresses (1) **3 x 1 marks 3 marks**

2. *College staff can obtain the A Level specifications for their subjects from the AQA website. These are provided as Portable Document Format (PDF) files.*

(a) *Give **three** possible reasons why PDF has been selected as the format in which to provide these files.*

(b) *The AQA website has an Internet Protocol (IP) address, which has the form: n.nnn.nnn.nnn. Explain the role of IP addresses in the functioning of the Internet.*

(c) *College staff do not need to know the IP address of the AQA website, as they can use the Uniform Resource Locator (URL) instead. <http://www.aqa.org.uk>.*

*Explain **two** benefits to the college staff of using the URL. (3 marks) (2 marks)(4 marks)*

(a) The following answers are examples only. Allow one mark for any point that relates to why the exam board have chosen PDF.

Any 3:

- standard for document sharing on the web (1)
- exam board cannot guarantee the system type that viewers will have (1)
- software to read the document is freely available (1)
- formatting is retained. (1)
- .e.g. logos/ forms/ fonts (1)
- content can be copied and pasted into other applications (1)
- content of this document format is easily accessible but harder to change (1) **Max 3 x 1**

(b) Any 2:

- uniquely identifies single machine (1)
- if more than one machine has same address, data cannot be routed towards it (1)
- provides a consistent way to refer to a specific machine (1)
- formal standard for addressing (1)
- hierarchical addressing scheme (1)

DO NOT accept answers about URLs . this part of question specifically asks about IP addressing. Max 2 x 1 (2 marks)

(c) Example answers. Credit any reasonable response. • benefit (1) expansion (1)

- staff find it more readable/ understandable than IP address (1) well-chosen name easier to recognize than numbers (1)
- staff more likely to remember (1) don't have to remember IP addresses (1)
- staff able to view selected information (1) points to a specific web page /website (1)
- staff don't have to be aware of changing IP addresses (1) can be redirected (1)

DO NOT accept answers explaining IP addresses . this part of question specifically asks about URLs. 2 x (2, 1, 0) 4 marks

3. An office worker is having problems connecting to the Internet. A technician fixes this problem, but finds that several websites cannot be viewed correctly, as the page content is not standard.

a) Define the term protocol in relation to networking.

b) Explain why standards are important for communication over the Internet.

c) Explain the need for standard data representation in relation to networking and the Internet.

a) A set of rules (1) that defines how devices communicate over a network (1). **2 x 1 mark**

b) 1 mark each for up to 3 points. The following are examples.

- provides an addressing mechanism so devices can be uniquely identified (1)
- ensures that all devices are set up in similar ways (1)
- provides error detection and correction mechanisms (1)
- provides for a reliable connection between devices (1)
- allows for open systems/ no reliance on one manufacturer (1)
- mentioning the use of appropriate protocols e.g. TCP/IP (1) **3 marks**

c) 1 mark per point up to 2 points. The following are examples.

- to allow different software to understand the data (1)
- to allow different hardware platforms access to the data (1)
- mentioning the use of appropriate protocols/file types e.g. HTTP, MP3, GIF (1) **2 marks**

3. A teacher wishes to read the GCE Advanced Mathematics syllabus on the AQA website. The website holds this syllabus in a format known as Portable Document Format (PDF).

*(a) Give **three** reasons why PDF has been selected as the format in which to offer this file.*

(b) When the teacher tries to print the PDF file, it is discovered that the correct printer driver is not installed. Explain why a printer driver is necessary.

(c) In order to acquire the correct printer driver, the printer manufacturer's website is visited. When the link leading to the download area of the website is followed, the address becomes "http://192.168.0.233/downloads/drivers.htm".

(i) What does the "http" part of the address represent?

(ii) "192.168.0.233" is an Internet address. Explain why Internet addresses are important for the correct functioning of the Internet.

a) The following answers are examples only. Allow one mark for any point that relates to why the exam board have chosen PDF.

- de facto standard for document sharing on the web (1)
- exam board cannot guarantee the system type that viewers will have (1)
- software to read the document is freely available (1)
- formatting is retained (1)
- e.g. logos/ forms/ fonts (1)
- content can be copied and pasted into other applications (1)
- content of this document format is easily accessible but harder to change (1) **3 x 1 mark**

b) Any 2 from:

- translates document into a form usable by the printer (1) e.g. deals with margins/ fonts/ paper sizes/ etc. (1)
- enables communication between printer and OS/ application package (1) **2 x 1 mark**

c)

i) the protocol being used (1) **1 mark**

ii)

- needs to be unique so that only one machine is identified (1) (2 marks)
 - if more than one machine has the same address, data cannot be routed towards it (1)
 - provides a consistent way to refer to a specific machine (1) (1 mark)
 - formal standard for addressing (1)
 - hierarchical addressing scheme (1)
 - DO NOT accept answers about URLs – question specifically asks about IP addressing.
- 3 x 1 mark**

4.